

44956

Second Report of the
Commissioners appointed
to enquire into and
report upon the system of
superintending & executing

Public works
in the Andros Presidency

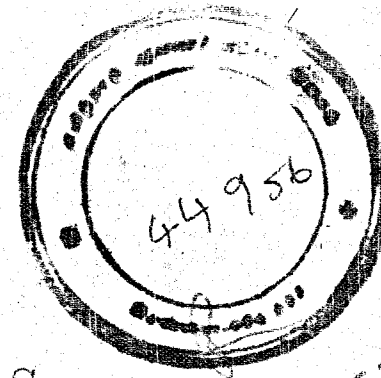
R
21.211 MS3C
MS3
44956

A 50 B 601

SECOND REPORT
OF
THE COMMISSIONERS
APPOINTED
TO ENQUIRE INTO AND REPORT
UPON THE
SYSTEM OF SUPERINTENDING & EXECUTING
PUBLIC WORKS,
In the Madras Presidency.

SUBMITTED
TO THE RIGHT HONORABLE THE GOVERNOR IN COUNCIL
OF
Fort St. George.
ON THE 18TH NOVEMBER 1853.

CONTENTS.



CONTENTS.

REPORT.

DI-211ms3f
ms3

SECTION I.

ON THE ESTIMATES OF THE PUBLIC WORKS DEPARTMENT.

Page.

PART I.—The various kinds of Estimates; and the power vested and proper to be vested, in the several authorities, to sanction Estimates.....	1
„ II.—The forms of Estimates and the degree of detail with which they should be prepared and should be sent up to the controlling authorities.....	16

SECTION II.

ON THE EXECUTIVE SYSTEM OF THE ROAD DEPARTMENT.

PART I.—General description of the system.....	32
„ II.—Detailed examination of the accounts of certain works, in illustration of the system.....	37
„ III.—Some improvements suggested.....	45

SECTION III.

ON THE EXECUTIVE SYSTEM OF THE REVENUE OR MARAMUT DEPARTMENT.

PART I.—A description of the system; illustrated by an examination of the actual accounts of certain works.....	51
„ II.—Examination of the operation of the system on certain points; the mode of preparing the bills, the payment of the people employed, the delays, and the bulk of the correspondence and documents.....	5
„ III.—Reforms proposed in the Maramut executive system.....	

SECTION IV.

ON THE EXECUTIVE SYSTEM IN

„ I.—The system

* செப்பனிடுவதற்காக எடுத்தது *
* கொள்ளப்பட்டது *

* செட்டர் மாதம் 88 வருடம் *

* செப்பனிடும் முடித்த *

* செட்டர் மாதம் 88 வருடம் *

* ஆராய்ச்சி உதவியாளர் *
* கையொப்பம் *

CONTENTS.

SECTION V.

THE BILLS IN THE DEPARTMENT OF PUBLIC WORKS.

PART I.—The forms of the bills.....	104
„ II.—The mode of examining and auditing the bills.....	118
„ III.—The authorities competent to pass bills.....	132
„ IV.—The delays in the preparation, submission, and auditing, of bills.....	136

SECTION VI.

ADVANCES FOR THE EXECUTION OF PUBLIC WORKS, AND THE ADJUSTMENT OF SUCH ADVANCES.

PART I.—The advances and adjustments in the Military Department ..	143
„ II.—The advances and adjustments in the Revenue Department.....	146
„ III.—The advances and adjustments in the Road Department.....	155
„ IV.—The changes proposed.....	159
„ V.—The mode of providing funds for payments in the Talooks.....	179

SECTION VII.

ON THE MODE OF RECORDING THE CHARGES FOR PUBLIC WORKS IN THE GENERAL BOOKS OF ACCOUNT.

PART I.—The present practice described, and illustrated by examples.....	180
„ II.—Changes proposed in the present system of keeping the accounts.....	198

SECTION VIII.

SUMMARY, AND CONCLUDING REMARKS.

PART I.—Summary of the report.....	213
„ II.—Concluding remarks.....	221

CONTENTS.

APPENDIX.

APPENDIX A.

Memorandum by Major Pears, C. B. Acting Member of the Military Board, dated February 16, 1850, regarding the Executive Department of Public Works.....	Page. 1
--	---------

APPENDIX B.

Letter from F. N. Maltby Esq. Collector of Canara, to the Secretary to the Board of Revenue Fort St. George, dated November 12, 1850; on the subject of payments from the Talook Treasuries.....	4
--	---

APPENDIX C.

Letter from Military Board Calcutta, to Military Board Madras, dated 22nd June, 1852; as to the mode of sanctioning Estimates for Repairs, and Bills for work done.....	5
---	---

APPENDIX D, 1.

Specimen Estimate for a new work of Irrigation; such as it is proposed shall be sent up to the controlling authorities.....	7
---	---

APPENDIX D, 2.

Specimen detailed working Estimate for the same work as the foregoing; such as it is proposed shall be not sent up, but retained by the District Engineer for the guidance of the Officer executing the work.....	8
---	---

APPENDIX E, 1.

Specimen Estimate for a new Road; such as it is proposed shall be sent up, to the controlling authorities.....	10
--	----

APPENDIX E, 2.

Specimen detailed working Estimate for the same work as the foregoing; such as it is proposed shall be not sent up, but retained by the District Engineer for the guidance of the Officer executing the work.....	12
---	----

APPENDIX F, 1.

Specimen Estimate for a new work of building such as is proposed shall be sent up to the controlling authorities.....	
---	--

APPENDIX F, 2.

Specimen detailed working estimate for same work as the foregoing; such as it is proposed shall be not sent up but retained by the District Engineer for the guidance of the Officer executing the work.....	
--	--

CONTENTS.

APPENDIX G, 1.

Estimate made by Mr. Bruce, Chief Engineer of the Madras Railway for the earthwork, masonry, ballasting, fencing, &c. of one Section of 12½ miles.....	Page. 32
--	-------------

APPENDIX G, 2.

The detailed measurements of certain bridges, drains and other works included in the foregoing Estimate.....	35
--	----

APPENDIX G, 3.

Memorandum of the quantities of bricks and chunam required for each one of the masonry works included in the Estimate in Appendix G 1, and the quantities required in each mile of the Section.....	41
---	----

APPENDIX G, 4.

The detailed measurements of the earthwork of one mile of the Section included in the Estimate in Appendix G 1, given as a specimen.....	43
--	----

APPENDIX H, 1.

New form for Quarry book in the Road Department.....	45
--	----

APPENDIX H, 2.

New form for Cartage book in the Road Department.....	46
---	----

APPENDIX H, 3.

New form for the Road book, in the Road Department.....	47
---	----

APPENDIX H, 4.

Form for the roll of labourers employed on monthly wages, to be written at an end of the Road book.....	49
---	----

APPENDIX H, 5.

New form for the Roller Book in the Road Department.....	50
--	----

APPENDIX H, 6.

New form for the Establishment Book.....	51
--	----

APPENDIX H, 7.

New form for the Overseer's Cash Book in the Road Department.....	52
---	----

APPENDIX H, 8.

Form of the Abstract for Road Work, abstracted from the Cash Book in Appendix H 7.....	57
--	----

APPENDIX H, 9.

Form for Road Work prepared from the Abstract H 8.....	58
--	----

APPENDIX I, 1.

.....	59
-------	----

CONTENTS.

APPENDIX I, 3.

Form for the daily Register of people employed and work done.....	62
---	----

APPENDIX I, 4.

Form of the abstract for Bridge work, abstracted from the Cash Book in Appendix I 3.....	63
--	----

APPENDIX I, 5.

Form of Bill for Bridge work prepared from the abstract I 4.....	66
--	----

APPENDIX J, 1.

Form for the Report of workmen employed at a work under the Superintending Engineer Presidency Division; proposed temporarily in lieu of the present forms.....	67
---	----

APPENDIX J, 2.

Form for Report of materials supplied for a building under the Superintending Engineer Presidency Division.....	68
---	----

APPENDIX J, 3.

Form for Report of workmen employed in the Carpenters' yard on account of a building.....	70
---	----

APPENDIX J, 4.

Form for the Report of materials supplied at the Carpenters' yard for a building.....	71
---	----

APPENDIX J, 5.

Form for abstract of the Work people employed on account of a building.....	72
---	----

APPENDIX J, 6.

Form for abstract of the materials supplied on account of a building.....	73
---	----

APPENDIX J, 7.

Form for the bill prepared from the abstracts in Appendices J, 5 and J, 6.....	75
--	----

APPENDIX K.

Specimen Bill for Road work, in lieu of the several bills now prepared in the Road Department.....	76
--	----

APPENDIX L.

Memorandum of balances of advances for Public Works, outstanding against workmen and contractors in certain Collectorates of the Madras Presidency.....	77
---	----

APPENDIX M.

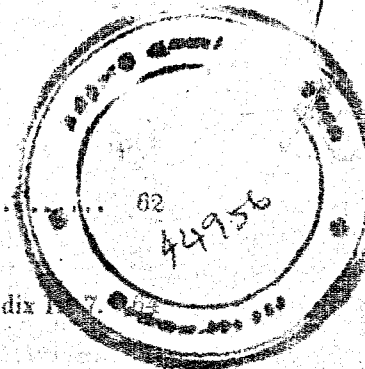
Rules for estimating periodically, the value of Buildings, the property of the Honorable Company, under this Presidency, submitted by the Military Board, and sanctioned by Government in Minutes of Consultation, 7th October, 1839.....	78
---	----

APPENDIX N.

Dead Stock account extracted from the Military Board Books.....	79
---	----

APPENDIX O.

Form for the Journal showing the transactions on account of the Public Works to be prepared in the Department of Public Works for transmission to the Accountant General.....	81
---	----



CONTENTS.

APPENDIX P.

Form of the Ledger for the Journal in the Appendix O, with an Index..... 87

APPENDIX Q.

Statement shewing the periods elapsing between the several steps in the progress to audit, in the case of the bills for ordinary repair of Irrigation works in certain Districts for certain years..... 104

APPENDIX R.

Statement shewing the time that elapsed between the several steps in the progress of certain Occasional works in the Revenue Department from the date of estimate to the final sanction of the bill..... 105

APPENDIX S.

Statement shewing the time elapsing between the various stages in the progress of certain bills to audit in the Road Department..... 109

APPENDIX T.

Statement shewing the number of days from one stage to another in the execution of certain works and the progress of the Bills to audit in the Military Department..... 111

APPENDIX U.

Form of the Annual Cash estimate to be submitted by the District Engineer to the Inspecting Engineer..... 112

APPENDIX V.

Form of the Annual Cash Estimate, to be submitted by the Inspecting Engineer to the Board of Works..... 115

APPENDIX W, 1.

Form of the Annual Budget of expenditure on Public Works, to be submitted by the Board of Works to Government..... 116

APPENDIX W, 2.

Form of the Abstract memo. shewing the amount of Estimate and expenditure in previous years for comparison to be annexed to the Estimate in Appendix W, 1..... 119

APPENDIX X.

Form of monthly Estimate to be sent by an Executive Agent to the District Engineer..... 121

APPENDIX Y.

Form of monthly Abstract prepared by the District Engineer from the monthly Estimates of the Executive Agents for submission to the Inspecting Engineer..... 123

APPENDIX Z.

Form of letter of credit to be granted by the Inspecting Engineer to the Collector..... 124

APPENDIX A. A.

Form of ten days' report to be submitted by an Executive Agent to the District Engineer, shewing the probable requirement of cash during the next ten days..... 125

CONTENTS.

APPENDIX B. B.

Form of Register to be kept by the District Engineer shewing the drafts and receipts drawn by him on the Tahsildars &c. on account of the Letter of credit..... 126

APPENDIX C. C.

Form of monthly Progress Report of works in charge of a Foreman to be sent to an Executive Agent..... 127

APPENDIX D. D. 1.

Form of monthly Account Current of an Executive Agent in charge of a Section of a District to be sent to the District Engineer..... 128

APPENDIX D. D. 2.

Form of monthly statement shewing the particulars of charges incurred on the several works in progress, to accompany the monthly Account Current of the Executive agent..... 129

APPENDIX E. E.

Form of monthly abstract Statement of actual charges to be prepared by the District Engineer from the statement of charges received from the Executive Agent and transmitted to the Inspecting Engineer..... 131

APPENDIX F. F.

Form of the monthly Account Current of the District Engineer to be submitted to the Board of Works..... 132

APPENDIX G. G.

Form of Register to be kept by an Executive Agent for each year; shewing the particulars of works ordered to be executed..... 134

APPENDIX H. H.

Form of Register to be kept by a District Engineer for each year; shewing the Estimates submitted, and the subsequent stages of execution..... 136

APPENDIX I. I.

Form of Register shewing the Estimates received and other particulars, to be kept by the Inspecting Engineer for each District of his Division..... 138

APPENDIX J. J.

Form of Abstract Register shewing the Estimates arranged under the different heads to be prepared from the Register in Appendix I. I..... 140

APPENDIX K. K.

Form of Register to be kept by the Inspecting Engineer shewing the actual expenditure in each month under the different heads, to be filled up from the abstract statement of charges in Appendix E. E..... 141

APPENDIX L. L.

Form of monthly Account Current to be submitted to the Collector by a Tahsildar..... 142

APPENDIX M. M.

Form of monthly Estimate of receipts and disbursements to be submitted to the Collector by a Tahsildar..... 144

INDEX TO THE PARAGRAPHS.

SECTION. I	Paras.
ON THE ESTIMATES OF THE PUBLIC	
WORKS DEPARTMENT.	
<i>PART I.—The various kinds of Estimates; and the power vested and proper to be vested, in the several authorities, to sanction estimates.</i>	
Introductory	1
Estimates in the Military Department	2
Petty repairs	3
Emergent repairs	4
For works within Fort St. George or belonging to the Garrison	5
Course of proceeding	6
The general effect of the rules	7
The rules described	8
Estimates of the Road Department	9
Estimates of the Maramut Department	10
For ordinary repairs to irrigation works	11
The Ordinary Estimates described	12
“Occasional” Estimates	13
Power of the Collectors to authorize work	14
Emergent estimates	15
The powers of the local officers are too much restricted	16
But are inconsistently broad in the case of irrigation works	17
The rules ought to be enlarged	18
Evils of the present system	19
Delays in the repairs of Judicial Buildings	20
Of Revenue Buildings	21
Of Military Buildings	22
Of Ecclesiastical Buildings	23
Any informality greatly increases these delays	24
Repairs ought to be left to the local Officers	25
There would be no danger of abuse ..	”
Additional guarantees under the new system	26
The annual reports	”
The practice in Bengal	27
Some rules would be proper	28
The nature of the work	”
The amount	29
No other seems necessary	30
A permanent allowance for Roads	31
The works of irrigation	32
A money restriction would be sufficient ..	33
The money limit to be enlarged ..	34
The total to be limited	35
The annual lists of Estimates	36
They are inconvenient, and should be abolished	37
Emergent repairs would almost cease under the foregoing rules	38
A practice in Tanjore, which needlessly and very greatly increases the number of estimates	39
Very little “Ryot’s repair” appears to be done in Tanjore	40
A composition or contract might perhaps be made with the Meenastars	41
There will be an efficient check on injudicious or improper repairs	42
Annual reports on repairs ..	43
Applications for new works or improvements ..	44
The local officers should be empowered to authorize improvements to roads	45
The discouraging effect of the present restrictions ..	46
Illustrated by a comparison ..	47
A certain sum to be at the disposal of the authorities in each District	48
The disposal of it in whom to be vested ..	49
<i>PART II.—The forms of Estimates, and the degree of detail with which they should be prepared and should be sent up to the controlling authorities.</i>	
The general form of the Estimates at present ..	50
The forms in the Revenue Department ..	51

Paras.	Paras.
The short form for works of irrigation.... 52	The detailed estimate for the same..... 88
The long form for Irrigation works..... 53	The "Board estimate" for roads..... 89
The form for buildings..... 54	The detailed estimate for the same.... 90
For roads..... "	The estimates for buildings..... 91
For the repair of irrigation works..... "	General remarks on some points in the pro-
An estimate should be an estimate only.. 55	posed forms..... 92
The number of estimates hereafter will be	The Measures used..... "
diminished..... 56	The headings..... 93
Estimates in the Military Department.... 57	The estimates to be numbered..... "
In the Road Department..... "	Fractions are omitted..... "
The mode of examining estimates..... 58	The Railway forms of estimate..... 94
In the Military Department..... "	The "estimate" of the works..... 95
Further examination..... 59	The detailed measurements..... 96
In the Revenue Department..... 60	Specifications..... 97
The rates how examined..... 61	
Further processes in the examination.... 62	
The estimates in the Road Department how	
examined..... 63	
Remarks on the several processes of the ex-	
amination..... 64	
The first process; comparison with the plan.. "	
The second process; recalculating the items. 65	
Only very little trifling error in calculation is	
discovered..... 66	
The practice is useless, and should be dis-	
continued..... 67	
The third process; testing the rates..... 68	
The proper use of this process..... 69	
The proper mode of examining estimates.... 70	
By the Inspecting Engineers..... "	
By the Board..... 71	
An efficient executive is essential..... "	
In what detail estimates ought to be prepared. 72	
Some estimates are much more detailed than	
others..... 73	
In some bridge estimates useless minuteness of	
detail is given..... 74	
The apparent exactness is deceptive..... 75	
The centrings..... 76	
The plastering..... "	
The minute detail of estimates need not be	
sent up to the Board..... 77	
An example of the inutility of sending up such	
detail..... 78	
Showing also the uselessness of the "long	
form" of occasional estimate..... 79	
And the effect of the present forms in im-	
peding improvement..... 80	
Another instance..... 81	
Further particulars..... 82	
The amount of detail proper to be sent up to	
the Board..... 83	
In the case of roads..... 84	
What information to be laid before Govern-	
ment..... 85	
Forms of estimates are given in the Appendix. 86	
Remarks on the forms, the "Board estimate"	
for irrigation works..... 87	

SECTION II.

ON THE EXECUTIVE SYSTEM OF THE ROAD DEPARTMENT.

PART I.—General description of the system.

Introductory..... 98
The system of the Road Department..... 99
The agents employed..... 100
The Pygusts and Concapillays..... 101
The Maistries..... 102
The Overseers..... "
The Ticket system..... 103
The several kinds of tickets..... 104
The mode of cashing the tickets..... 105
Mode of tasking the labourers..... 106
The good results of the ticket system.... 107
It also saves office work, and economizes
superintendence..... 108
The station books..... 109
How they are used..... 110
They form a complete record..... 111
They greatly diminish correspondence and
reports..... 112
What books an Overseer keeps..... 113

PART II. Detailed examination of the accounts of certain works, by illustration of the system.

The books of the First Division of the Wes-
tern Trunk Road..... 114
The detailed accounts of the work..... 115
The Quarry book..... "
The Cartage and Road Books..... 116
The Roller book and Receipt book..... 117
The Cash book..... 118
How the entries in it are made..... 119
The mode of preparing the bills..... 120
The bill for collection of materials..... 121
The bill for cartage..... 122
The bill for spreadage..... 123
The bill for earthwork..... "
For sundry labour..... 124
For sundry charges..... "

Paras.	Paras.
The books of the construction of the Palma-	Their value..... 159
nair bridge..... 125	The practice as to small repairs to works of Ir-
Description of the accounts received..... 126	rigation..... 159
The first part of the bridge book..... 127	Delays and their causes..... 160
The second part of it..... 128	Defective means of preventing them..... 161
The third part of it..... 129	Balance due to the work people when paid.. 162
Its contents further described..... 130	Works of a larger class..... 163
The cash books..... 131	The detailed accounts of works..... 164
The second cash book..... 132	The accounts of Tinnevely..... 165
The bills how prepared..... 133	The accounts of Tanjore..... 166
Remarks on the accounts of the bridge..... 134	They are very voluminous..... 167
The system of accounts in the department is	And very confused and difficult to under-
good, but the rules are not duly enforced.. 135	stand..... "
Instances..... "	Explanatory statements A and B..... 168
Irregular entries in the cash book..... 136	Statements C and D..... 169
The payments too unfrequent..... "	Even these elaborate statements do not make
	the accounts clear..... 170
	The accounts of Guntoor..... 171
	The daily accounts are in minute detail.. 172
	But are confused and intricate..... 173
	The abstract statements, and the mode of
	preparing the bill..... 174
	The accounts of Bellary..... 175
	The daily accounts are very meagre..... 176
	The monthly abstracts..... 177
	The accounts of Cuddapah..... 178
	The prices of the materials are not shown.. 179
	The accounts of Salem..... 180
	Very irregular and incomplete..... 181
	The yearly abstracts..... 182
	Remarks on the foregoing accounts..... 183
	Their enormous bulk makes scrutiny impos-
	sible..... 184
	And they are very confused and intricate.. 185
	The daily accounts are useless for prompt
	check..... 186
	Voluminous and confused accounts are ef-
	fectual for the purposes of fraud..... 187
	PART II.—Examination of the operation of the sys-
	tem on certain points; the mode of preparing the
	Bills, the payment of the people employed, the
	delays, and the bulk of the Correspondence and
	documents.
	The mode of preparing the bills..... 188
	The total amount how determined..... 189
	The total how divided..... 190
	An example..... 191
	This division is arbitrary and not based on the
	accounts..... 192
	Further notice of the mode of making it.... 193
	Instance from the Cuddapah Cutcherry.... "
	Instance from the Condaveed talook Cut-
	cherry..... 194
	Similar methods followed in all districts.... 195
	Remarks; the data rates..... 196
	Temptation to untruthfulness..... 197

SECTION III.
ON THE EXECUTIVE SYSTEM OF THE REVENUE OR MARAMUT DEPARTMENT.

PART I.—A description of the system; illustrated by an examination of the actual accounts of certain works.

Sources of information as to this department. 157

	Paras.
The preparation of the bill in small works....	198
The security that the labourers are properly paid.....	199
The small value of receipts taken from them..	200
Instance in proof of it.....	201
Their small value in securing the Government from wholesale fraud.....	202
The system entirely fails in that particular..	203
The case of labourers on the smaller works..	204
Delays in execution, and preparing the bill..	205
Table of delays.....	206
Remarks on the table.....	207
The causes of delay in small works.....	208
Delay in works of a larger class.....	209
A table of delays.....	"
The Collector's Cutcherry at Cuddapah..	210
The bridge in Salem.....	"
The road in Bellary, and other works.....	211
The causes of these delays; in the Tahsildar's Cutcherry.....	212
In the Collector's Office.....	213
The evils of the delays.....	214
The voluminous correspondence and other documents.....	215
Examples of this.....	216
Frequent journeys of the village officers and others to the Cutcherry.....	217
The detention there.....	218
PART III.—Reforms proposed in the Maranul Executive System.	
The present system is bad, and ought to be changed.....	219
The executive agents must be placed under direct professional direction.....	220
The proposal is not new.....	221
Various reasons make the change necessary	222
Major Pears' scheme.....	223
The opinion of the Board of Revenue upon it.....	224
The aid of the Revenue officers is not required	225
The change of system is necessary in order to put a stop to forced labour.....	226
The Hussanoor Ghaut road.....	227
It was made by free labour.....	228
The Walliur Road.....	229
Very moderate wages are sufficient, if fully and punctually paid.....	230
The foregoing facts prove that free labour can be readily obtained.....	231
But as long as the Revenue officers employ or supply labour, it will be forced.....	232
The change would raise the character of the Revenue Servants.....	233
The executive ought on every consideration to be a separate department.....	234

	Paras.
Collectors would have full means to ensure the due repair of works.....	235
And to advance improvement.....	236
Detailed arrangements of the new Executive	237
Division of duties.....	238
The executive Agency.....	239
Its distribution.....	240
The mode of executing work.....	241
Tank and channel work.....	242
The Cheyaur Anicut and channels.....	243
Punctual and fair payment is essential.....	244
Great reduction in accounts and correspondence.....	245
The office establishments.....	246
The execution will be prompt.....	247
Great waste of Superintendence under the present system.....	248
Functions of the Collectors in connection with Public Works.....	249
Statistical registers of the works of irrigation to be prepared.....	250
The great utility of such registers.....	251
Maps and instruments should also be abundantly supplied.....	252
Duties of a District Engineer.....	253
He will make and submit estimates.....	"
Will execute work.....	254
Will verify and submit bills.....	"
And will be the custodian of all Public Works	"
He will need to be much on the march..	255
Civil Engineers now keep detailed diaries	256
The greater part of them may be dispensed with.....	257
The duties of an Inspecting Engineer.....	258
He will make annual and occasional tours..	259
His duties as regards estimates.....	"
And bills.....	"

SECTION IV.

ON THE EXECUTIVE SYSTEM IN THE MILITARY DEPARTMENT.

PART I. The system described.

The Presidency Division as a sample of the system.....	260
Proceedings after an estimate has received sanction.....	261
The system of obtaining building and other materials.....	262
The system is objectionable.....	263
It affords facilities to fraud.....	264
The expediency of having a single general supplier is questionable.....	"
The Carpenter's yard.....	265
The immediate executive agency.....	266
Indents for materials.....	267

	Paras.
The daily reports received from the work....	268
The "Morning Reports".....	269
The means of checking the daily reports....	270
Other accounts kept at the work.....	271
Monthly "Progress Report" to the Board....	272
The mode of paying the labourers.....	273
Those paid weekly.....	274
Delay in getting money from the office....	275
Those paid monthly.....	276
Still more delay and complication.....	277
Total delay.....	278
The payment of the labourers is entirely left to the Conacapillays.....	279
The Conacapillays make their own bargain with them.....	280
And no doubt derive illicit advantage from them.....	281
The practice of mulcting labourers when a bill exceeds the estimate.....	282
The supplier's bills are settled for each month	283
Long delays in their settlement.....	284
The mode of preparing the bills.....	285
For labour;.....	286
And for materials.....	287
The remaining processes in the preparation..	288
The delays in preparing the bills.....	289
A work taken as an example of the system..	290
The progress of its execution.....	291
Remarks upon it; delays.....	292
Bulkiness of the accounts.....	293
Comparison with the Revenue and the Road Departments.....	294
PART II.—Suggestions for improving the system.	
The daily accounts might be much abridged..	295
Improved forms for them in the Appendix....	296
Explanation of the forms.....	297
Advantages of the new forms.....	298
In preparing the bills.....	"
In saving time and labour in the Engineer's Office.....	299
In facilitating the payment of the work people.....	300
And in expediting the settlement of the supplier's bills.....	0
Petty repairs in the Presidency Division.....	301
The order of October 2nd, 1849 should be made applicable.....	302
The use of printed forms would much abridge labour.....	303
Especially in receipts for money obtained from the Paymaster.....	304
The foregoing measures ought to be carried into effect immediately.....	305
But they would not mend the defective mode of paying the labourers.....	306

	Paras.
The Road Department executive system should be adopted.....	307
It is very suitable to the Presidency Division.	308
And could be easily introduced also in all the Divisions.....	309
Superintending Engineers are required to give money security.....	310
The practice should be dispensed with....	311
Very many Executive Officers in the Military Department do not give security..	312
Survey reports and certificates on Buildings..	313
The present minute inquisition is unnecessary and injurious.....	314
The mode of inspection proposed instead..	315
The practice in the Presidency Division....	316
Its inconveniences: changes recommended.	317

SECTION V.

THE BILLS IN THE DEPARTMENT OF PUBLIC WORKS.

PART I.—The forms of the Bills.

Division of the subject.....	318
Two general forms for bills.....	319
The natural and true form.....	320
Bills cannot be made bona fide in the Revenue Board's form.....	321
Or without a tampering with the accounts..	"
Their preparation in that form is very difficult and tedious.....	322
And bills in that form cannot be examined..	323
The bills should state actual facts.....	324
The bills in the Military Department.....	325
The declaration appended to them.....	326
It is not required in the other two branches of the Department.....	"
It is objectionable and should be discontinued.....	327
The bills of the Road Department.....	328
The bills of the Revenue Department.....	329
For ordinary repairs.....	"
Their inconvenient form.....	330
They contain various useless details.....	331
And matters out of place in a bill.....	332
The practice of sending up the ordinary bills in a yearly list should cease.....	333
Bills for Occasional work.....	334
These also should be sent up singly.....	"
This might be done without difficulty.....	335
Comparison with the number in the Military Department.....	336
And it is necessary to an effectual audit....	337
Remarks on the proposed forms for bills....	338
Periodical settlements.....	339
Examples of the inconvenience of bills for completed works only.....	340

	Paras.
Periodical settlements would involve no inconvenience.....	341
Yearly settlements should be adopted; and half yearly for large works.....	342
The uses of Periodical settlements.....	343
The settlement for tools and Machinery.....	344
Tools for the ordinary repair of made roads.....	345
The use of improved Machinery and implements should be encouraged.....	346
The value of such help.....	347
Instance of the Godavery Aicut.....	348
Latitude in the choice of means should be given to Engineer Officers.....	349
The best means cannot always be determined beforehand.....	350
Rigid restrictions would be of very injurious effect.....	351
Reference to the system of rigid restrictions in Ceylon.....	352
The effects of such a system would be very much worse in this country.....	353
There are symptoms of a disposition to introduce such a system.....	"
Testimony of the bad effects of the Ceylon system.....	354
Officers should be held responsible for their choice of executive means.....	355
And for not laying out enough, on machinery as well as for laying out too much..	356
Excess in this particular should be viewed liberally.....	"
PART II.—The mode of examining and auditing the Bills	
The audit in the Military Department.....	357
In the Chief Engineer's Office.....	"
By the Military Board.....	"
In the Military Auditor General's Office.....	358
In the Accountant General's Office.....	"
In the Transfer Department.....	359
The audit in the Military Department is effective.....	360
The audit in the Revenue Department.....	361
Examination by the Civil Engineers.....	"
In the office of the Board of Revenue.....	362
In the Civil Auditor's Office.....	363
The Course of audit there.....	364
Government sanctions are communicated to the Civil Audit Office, but not made use of.....	365
The fixed Maramut Establishments.....	366
The refunds.....	"
The audit of a year's accounts of Rajahmundry Collectorate.....	367

	Paras.
This mode of audit is irregular and unbusiness-like.....	368
The retrenchment made is not a real retrenchment.....	369
The audit is really made by the Board of Revenue.....	370
The audit does not influence the admission of charges into the Public accounts.....	371
The Civil Auditor ought not to take cognizance of advances.....	372
The course as to charges for Buildings and Roads.....	373
The Civil Auditor receives many useless returns and Statements from the Collectors.....	374
The audit of the Road Department bills.....	375
Mode of sending them up to Government..	376
How they are dealt with in the Government Office.....	377
The order of Government that they should be audited by the Civil Auditor.....	378
The mode in which it was complied with..	379
The rapid auditing of the arrears shows that an increase of establishment was not wanted.....	380
The general audit of the Road Department charges by the Civil Auditor.....	381
The salaries of the establishment.....	382
General remarks on the processes of the audit.....	383
The arithmetical examination is of little use..	"
The errors it discovers are utterly insignificant.....	384
The comparison of the bill with the estimate is pernicious if too much relied on.....	385
It encourages false accounts and leads to high charges.....	386
A scrutiny of all the detailed vouchers by the Controlling authority would be of little real value.....	387
Detailed tables and returns are not the best guarantee for efficiency.....	388
The real security is the high character of the Engineer Officers.....	389
The proper mode of checking and auditing the bills.....	390
Check by the District Engineer.....	"
By the Inspecting Engineer.....	391
By the Board of Public Works.....	392
A repetition of the arithmetical examination is quite unnecessary.....	393
It is not practised in Bengal.....	394
Or in the Ordnance Department, of the Madras Military Board.....	"
The arithmetical audit is the least important of all.....	395
The audit of the fixed Establishment charges..	396

SECTION VI.

PART III.—The authorities competent to pass bills.

The practice in the Road Department.....	397
In the Revenue Department.....	398
In the Military Department.....	399
Sanctioning power of the Military Board at present.....	400
The practice ought to be made uniform..	"
The powers of the Boards in this regard ought to be much enlarged.....	401
The Government cannot exercise an intelligent judgment on the question.....	"
When Government have sanctioned an expenditure, a second sanction for the same is superfluous.....	402
Analogous cases.....	403
The practice in Bengal.....	404
Rules proposed to be adopted here.....	405
As to bills in excess of estimates.....	406
Annual reports by the Board to Government..	407
Which would give the Government a more effectual control over the expenditure than they have now.....	"

PART IV.—The delays in the preparation, submission, and auditing of bills.

Lists of bills taken indiscriminately.....	408
Bills of the Revenue Department.....	409
For ordinary repairs to Irrigation works.....	"
Remarks on the statement.....	410
Delay in the Collector's Department.....	411
Delay in the Board's office.....	412
By the Civil Engineers.....	"
By the Government.....	"
Occasional bills in the Revenue Department..	413
Delays by the Collector's Department....	414
Delay in the Board's office.....	415
By the Civil Engineers and the Government..	"
Total delay.....	"
The bills of the Road Department.....	416
The delay in the office of the Superintendent.....	417
Causes of the delay.....	418
The bills in the Military Department.....	419
Delay in preparing and despatching the bills..	"
In the Chief Engineer's office.....	420
By the Military Board and Government..	"
In the Military Audit office.....	421
Total delays in the Military Department...	"
General result in all the Departments.....	422
Remedies in the Revenue Department.....	423
In the Road Department.....	"
In the Military Department.....	424
For the delay after sanction.....	"

ADVANCES FOR THE EXECUTION OF PUBLIC WORKS, AND THE ADJUSTMENT OF SUCH ADVANCES.

PART I.—The advances and adjustments in the Military Department.

Introductory.....	425
Advances in the Military Department.....	426
Multiplied correspondence.....	427
For petty and emergent work.....	428
For contract work.....	"
Advances to whom debited.....	429
Control by the Accountant General over these advances..	430
Accounts Current are also sent up by the Executive Engineer.....	431
The adjustment of advances: how the bills come up.....	432
Process of examining and passing them..	433
How they are dealt with in the Accountant General's office.....	434
The control is very complete in the Military Department.....	435

PART II.—The advances and adjustments in the Revenue Department.

There is much want of system.....	436
The mode of debiting the advances by Collectors for Irrigation works.....	437
The information given to the office of account is extremely meagre.....	438
The mode of debiting advances for buildings and roads.....	439
The monthly account particular; it is far too vague to be of use.....	440
To what head the advances are debited....	441
The receipts do not go to the Accountant General.....	"
Large sums lie in the hands of the Tahsildars.....	442
Adjustment of advances in the Revenue Department.....	443
The Accountant General is without the means of controlling it.....	444
Because the information in the Collectors' journals is defective.....	445
Examples of adjusting entries from the Collectors' journals.....	446
An instance as to "tanks and watercourses." ..	447
It is the same with other works.....	448
In some Districts advances are adjusted prior to the sanction of Government.....	449
And the Accountant General has no means of detecting this.....	450
There is no check over the refund of unexpended advances.....	451

	Paras.		Paras.
Or over the recovery of sums overpaid.....	452	The monthly estimate should not go to the Presidency.....	483
The present Accountant General has made some advances to control the adjustments.....	453	The foregoing arrangement will ensure the object.....	484
But the Government rather discouraged such endeavour.....	454	The departmental function; the control of the advances, and their adjustment.....	485
Thus there is great want of control over the advances and adjustments in this Department.....	455	At present there is no control in the Revenue and the Road Departments.....	"
Contrast between the Revenue and the Military Department in this respect.....	456	And in the Military Department it is effected in a clumsy manner.....	486
PART III. <i>The advances and adjustments in the Road Department.</i>		Advances how to be drawn by the District Engineer.....	487
The general features of the system.....	457	Supplemental credits.....	488
The Superintendent obtains money from the Collectors.....	458	Officers in charge of special works.....	"
There is no check over the amount of his Drafts.....	459	The difference between a credit given, and an acknowledgment for cash received.....	489
How the money is drawn, and what accounts are kept.....	460	The monthly letter of credit how to be ultimately disposed of.....	490
Irregularity and confusion in the system.....	461	Only the total amount of the monthly credit should be strictly construed.....	491
Improvements suggested.....	462	It will be current for one month only.....	"
Little check over the advances in this department.....	463	Certain Registers to be kept by the Inspecting Engineer.....	492
The journals of the Collectors and of the Superintendent are not compared.....	464	The nature of certain of the items comprised in the budget.....	493
For the total amount of the Superintendent's drafts checked.....	465	The yearly allowances for Public Works to be strictly limited to the year.....	494
Adjustment of advances in the Road Department.....	466	Appropriations for special works to be similarly limited.....	"
Thus the accounts of this department also are under no due control.....	467	The system proposed will not be derogatory to the Collector.....	495
PART IV. <i>The changes proposed.</i>		The various functions united in the Collector.....	496
Want of uniformity at present.....	468	Examples of the proposed arrangement already existing.....	"
Advances; detailed restrictions are injurious.....	469	The distribution of funds to the executive Agents.....	497
Advances should be made to the Executive Officer.....	470	Statements of cash required to be sent in by them every ten days.....	498
How to be debited.....	471	Registers of the drafts to be kept by the District Engineer; and by the Collectors.....	"
To the officer by his official designation and not by name.....	472	The advances should not be specific for particular works.....	499
Two separate functions connected with the advances.....	473	But general to be employed as required on the works in progress.....	500
The financial function; providing the funds.....	474	The real nature of the advances under the new executive system.....	501
The annual financial estimate; by whom and from what materials to be prepared.....	475	Greatly increased check over the Commissioned Executive Officers.....	502
Through what channel to be submitted.....	476	As well as over the Subordinate Agents.....	"
Forms for the Financial Estimates.....	477	The Executive Agents will send monthly Accounts Current to the District Engineer.....	503
Their uses.....	478	And the District Engineers will render Accounts Current to the Board of Public Works.....	504
Monthly estimates of cash required, to be sent monthly to the Collector.....	479	The control of the advances should be in the Board of Works.....	505
The materials on which they will be based.....	480		
The amount wanted in each Talook to be specified.....	481		
The Collector will easily arrange for the provision of the funds wanted.....	482		

	Paras.		Paras.
The abstracts of the Cash book for particular works.....	506	The Collectors' Journals.....	534
An office Register to be kept by the Executive Agents.....	507	Remarks on the heads;.....	535
And another by the District Engineer.....	508	The heads of advance.....	"
Progress reports of works in execution.....	509	The heads of charge.....	536
The operation of the proposed system as regards the Civil works in the Mysore and Saugor Divisions.....	510	Repairs of Tanks;.....	"
Its operation as regards Military work in all the Divisions.....	511	Repairs of Roads;.....	"
Concluding remarks.....	512	Public Roads.....	"
Reasons for giving forms for accounts.....	513	New Buildings.....	537
Salaries and allowances.....	514	Repairs of Buildings.....	"
How and by what officers to be paid.....	515	Civil Engineers' Salaries and other charges.....	538
How to be audited.....	516	The Sub-Treasurer's Journal.....	539
How to be debited and classified.....	"	The books in the Military Department.....	540
Variable and office allowances.....	517	The Paymasters' Journals.....	"
PART V. <i>The mode of providing funds for payments in the Talooks.</i>		Extracts from Paymasters' Journals in illustration.....	541
Coin for Talook payments is now carried from the Talook to the Collector's Treasury and back again.....	518	Remarks on the foregoing.....	542
And it is the same with funds supplied to the Military Paymasters.....	519	Adjustment of advances where made.....	543
The practice has recently been made more strict.....	520	The transfer Journal.....	544
Further orders.....	521	The Military General Journal.....	545
Present condition of the rules.....	522	The heads of charge enumerated.....	546
They are too narrow.....	523	Remarks.....	"
The change advocated would not increase the trust placed in the Tahsildars.....	524	The Journal of the Superintendent of Roads.....	547
And he is already trusted much more largely in other ways.....	525	The Journal of the Superintendent of Public Roads.....	548
Examples from the practice of Nellore and Canara.....	526	Accounts Current would be better for these two officers.....	"
The exceptions allowed by Government justify the entire abrogation of the rule.....	527	The Territorial Journal.....	549
The Talook Cash accounts should be balanced daily; and the cash chest occasionally examined.....	528	The heads of account in it for Public Works.....	550
A monthly Account Current to the Collector.....	529	The classification is wanting in clearness.....	551
These accounts should be in English.....	530	Instances.....	"
Sufficient knowledge of English would be easily obtained.....	531	Civil Buildings.....	"
Documents purely official need not be in the Vernacular.....	532	Repairs of Civil Buildings are shown distinctly.....	552
SECTION VII.		New Buildings might have been so exhibited also.....	553
ON THE MODE OF RECORDING THE CHARGES FOR PUBLIC WORKS IN THE GENERAL BOOKS OF ACCOUNT.		The books fail to furnish some valuable information.....	554
PART I.— <i>The present practice described and illustrated by examples</i>		Instances; the charges for Roads.....	"
Introductory.....	533	The charges for Irrigation Works.....	555
		This inconvenience has actually been experienced.....	556
		The charges for Marine Buildings.....	557
		The charges for the Public Works Establishments;.....	558
		They appear under seven distinct heads.....	"
		Of which only two are confined to such charges.....	559
		The Collectors' Maramut Establishments.....	560
		The Establishments of the Road Department.....	561
		PART II.— <i>Changes proposed in the present system of keeping the accounts.</i>	
		The objects to be effected.....	562
		The Board of Public Works to keep the books of the Department.....	"
		This course affords the best means of supervision and check.....	563

X.

INDEX TO THE PARAGRAPHS.

	Paras.
Examples already existing of the course here advocated.....	564
The same course should be followed in this Department.....	565
The books will be compiled without difficulty ..	"
The charges should be debited as soon as the bills are made out.....	566
The practice in the Civil Department.....	"
In the Military Department.....	567
In the Ordnance and Commissariat.....	568
The same practice should be adopted in the Public Works Department.....	569
The audit would follow with rapidity.....	570
The materials for the compilation of the Board's Journal.....	571
The classification of the charges.....	572
A specimen Journal and Ledger.....	573
The opening entries.....	"
The current transactions of each month.....	574
The Ledger.....	575
The Journal for April how to be prepared.....	"
The closing entries.....	"
Enumeration of the Heads of account proposed to be used.....	576
The heads for the transfer and closing entries.....	577
The system of account is simple and clear.....	578
And the Books will be under effective control by the Accountant General.....	579
A Balance sheet should be prepared annually.....	580
How to be composed.....	581
The scrutiny of this balance sheet.....	582
The Accountant General to scrutinize and report upon it.....	583
At present there is no such review and comparison.....	584
The statements now submitted are not prepared on a right basis.....	585
New mode of preparing the statements in the Revenue Department.....	586
In both Departments the statements are much wanting in detail.....	587
And there is great delay in their submission ..	"
The whole system of accounts must be reformed.....	588
The Dead Stock accounts.....	589
The Military Board's Rules.....	590
The practice in the Revenue Department.....	591
A better mode proposed.....	"
Dead Stock accounts of Irrigation works and Communications.....	592
The Financial Statement.....	593
Public Works how shown in it.....	594
It is not an authentic document.....	595
It may be made so as regards the Public Works.....	"
And it might be dispensed with altogether.....	596
A knowledge of accounts should be made general.....	597

SECTION VIII.

SUMMARY AND CONCLUDING REMARKS.

PART I. Summary of the Report.

	Paras.
Introductory.....	598
The First Section; Estimates.....	599
Recommendation as to repairs.....	600
Recommendation as to new works.....	"
The forms of estimates in use, and the mode of checking them.....	601
Degree of detail proper in an estimate.....	"
Second Section; the Road Department executive system.....	602
The agency employed.....	"
The ticket system.....	"
The station books.....	"
Certain accounts examined in detail.....	603
Improvements proposed. Better forms of accounts.....	604
The bills will be prepared easily and promptly; and be tested very simply.....	"
Third Section. The Revenue Department executive.....	605
The accounts of certain works examined.....	606
Some grave faults universal.....	"
The mode of preparing the bills.....	"
The payment of the work people.....	"
The great delays.....	607
Very bulky correspondence, Reports &c.....	"
The remedy; a separate executive under Engineer officers.....	608
The aid of the Revenue Department is not required.....	609
The separation is necessary in order to put a stop to the forcing of labour.....	"
Subordinate arrangements.....	610
The advantages of the change.....	"
Distribution of duties.....	"
The Fourth Section.....	611
The Military executive system.....	"
The subordinate Agency.....	"
The mode of paying the work people.....	612
The settlement of the Supplier's bills.....	613
The preparation of the bills for work executed.....	"
Detail of an actual example.....	614
Recommendations. Improved forms of accounts.....	615
The Road Department system to be adopted.....	"
Money security, and Survey Reports.....	"
The Fifth Section;.....	616
The bills.....	"
Their form.....	"
Periodical bills recommended.....	617
Bills for tools and Machinery.....	"
The audit in the Military Department.....	618
In the Revenue Department.....	"
In the Road Department.....	"
Mode of audit recommended.....	619
Audit of establishment charges.....	"

INDEX TO THE PARAGRAPHS.

XI.

	Paras.
Rule as to the passing of bills for work.....	620
Delays in the Revenue Department.....	621
In the Road Department.....	"
In the Military Department.....	"
The remedy.....	"
The Sixth Section; the advances and adjustments.....	622
The Military Department.....	"
The Revenue Department.....	"
In the Road Department.....	"
Change of system proposed.....	623
An annual Budget.....	624
Monthly credits.....	"
The check over the advances.....	625
And over the adjustments.....	"
Disbursements in the Talooks.....	626
The Seventh Section.....	627
The classification of the charges for Public Works.....	"
A set of Books to be kept by the Board of Public Works.....	628
Proposed classification of the charges.....	629
An annual Balance sheet.....	"
PART II. Concluding Remarks.	
Contracts.....	630
Conditions of success wanting in this country.....	631
Contracts in the Military Department.....	632
Contracts have not yet lessened the labour of the Officers of Government.....	633
The Superintending Engineer ought not to inspect Contract work.....	634
The Military Board ought not to have the Superintendence of contracts.....	635
More liberality must be shown as to terms.....	636
Agreements must be strictly construed.....	637
And equally as against both parties.....	"

	Paras.
Contracts may in time succeed better.....	638
Contracts in the Revenue Department.....	639
Cases in which contracts may properly be employed.....	640
They are unsuitable generally for other works.....	641
A Board for Public Works.....	642
The natural division of the business of administration.....	"
If that is neglected embarrassment and delay will ensue.....	643
Such has been the case at Madras.....	644
Additional causes of failure in the Department of Public Works.....	645
We have guarded against such mistakes.....	646
The advantages of a Board for deliberation.....	647
The magnitude of the duties to be performed.....	648
The continuity of a Board.....	649
A Board will have weight in advising the Government.....	650
Example: the late rules proposed by Government for the Maramut Department.....	651
A second example; the Road Department.....	652
Conclusions from these two examples.....	653
The plan of several independent Superintendents.....	654
One central departmental control is necessary.....	"
In the case supposed the Government would be the Board of Public Works.....	655
It is not qualified for the duty.....	656
And it would not be so even with an Engineer as a Secretary.....	657
Under such a system there would be no responsibility.....	658
Origin of the present Commission.....	659
Some consideration is due to the recommendations of such a Commission.....	660
Notice of the First Report.....	661

SECOND REPORT
OF THE
MADRAS PUBLIC WORKS COMMISSIONERS.

SECTION I.
ON THE ESTIMATES OF THE PUBLIC WORKS DEPARTMENT.

PART I.—THE VARIOUS KINDS OF ESTIMATES; AND THE POWER VESTED AND PROPER
TO BE VESTED, IN THE SEVERAL AUTHORITIES, TO SANCTION ESTIMATES.

1. In submitting to Government our first Report on the system of superintending and executing Public Works in this Presidency, we reserved for separate notice the Accounts of that Department; comprising Estimates, Bills, Advances and Adjustments, and the executive system. Upon those subjects we now accordingly proceed to report; and in treating of them we shall adopt the following order. We shall first take the Estimates; next the several systems of executing work in the Department; 3rd, the Bills for work done; 4th, the advances for works and the adjustment of such advances; 5th, the mode of classifying the charges for these works in the Public Accounts; and lastly, we shall briefly recapitulate our recommendations. And we must here remark that our late colleague Major F. Cotton having left the Presidency to take charge of the Godavery Division as Civil Engineer, we were deprived of his co-operation in this part of our labours.

Introductory.

2. In speaking of the Estimates, we will first enumerate the several descriptions in use in each of the three branches of the Department, and describe the authority vested in the several Officers to sanction the execution of work; proposing such amendments in both particulars as seem expedient.

Estimates in the
Military Department.

The Estimates in the Military Department are either for new work, including all improvements and enlargements, for ordinary repairs, or for emergent repairs; the last term signifying, such as cannot be postponed without material damage to the building. In the case of all works of the first description, however trifling, not only must the Estimate be sanctioned by Government but it is not allowed to be even prepared without the permission of the Government previously obtained, on a representation of the object, and the probable cost, of the proposed work.

As regards the second class of Estimates, much more latitude is properly allowed. Repairs not emergent are classed as ordinary and petty. Ordinary are all those necessary for preserving buildings, exceeding in amount the "petty repairs" to be described presently. Estimates for work of this nature are prepared by the Engineer Officer, and submitted through the Commanding Officer of the Division to the Military Board. If the amount of the Estimate is within 500 Rupees, that Board is empowered to sanction the work and order the necessary advances; but if the Estimate exceed that sum, it must receive the special sanction of Government.

Petty Repairs.

3. Petty repairs are for white washing or cleaning buildings, and making good small damages and dilapidations. Commanding Officers of Divisions are authorized without the sanction of any superior authority to direct the execution of every such petty repair, when the cost is not considered likely by the Engineer to exceed fifty Rupees. For such repairs he is empowered to order an advance not exceeding 500 Rupees at the commencement of each half year, to be repeated when required.

Prior to 1849 each of these very trifling repairs was treated as a separate work, and even when it consisted of no more than putting in a pane of glass, the same forms were gone through as for extensive repairs. Money was drawn on a separate receipt, and a distinct account was kept of the expenditure, a separate entry was made in the Journal, a separate Estimate and Bill were prepared, and the customary declaration was attached to the latter, that the Officer derived no pecuniary advantage from the execution of the work. In the year above mentioned the Government passed an order, on a representation from the Military Board, dispensing with Estimates for these trifling works, and directing that their amount should be included in a single half yearly bill for each Division. This arrangement relieved both the Military Board and the local executive Officers of a large quantity of labour, without in any degree impairing the control exercised over expenditure by the Board.

Emergent Repairs.

4. With respect to works of emergency, the powers of the local Officers are somewhat larger. In all matters immediately affecting the health of troops, Division Commanding Officers are empowered to sanction work to the amount of 500 Rupees in any one instance; and in the case of Commissariat buildings there is no money limit to the amount that may be thus disbursed at any one time, the sole condition being that the work shall be necessary to the preservation of the building or of its contents. But though the discretion allowed in the case of emergent works is thus so large, it is found in practice to be very sparingly taken advantage of, through the backwardness of Commanding Officers to incur the responsibility.

In 1849, at the same time with the order above noticed in the matter of the petty repairs, a beneficial change was made likewise with respect to the Emergent repairs. It was required previously, that detailed estimates for all such work should be sent up to the Military Board through the Quarter Master General. These estimates, prepared frequently after the execution of the work, generally came up for sanction about the same time with the bill for the same work, which latter supplied precisely the same means of checking the charges. It was justly considered therefore by the Military Board that the Estimates could serve no good purpose, while their preparation occupied a good deal of time; and the Board represented the circumstance to Government and obtained leave to discontinue their submission. The Ecclesiastical Department is excepted from these rules; in that department no emergent work is permitted. The most trifling repair to a church or other ecclesiastical edifice requires the special sanction of the Governor in Council.

For works within Fort St. George or belonging to the Garrison.

5. Estimates pertaining to works belonging to Fort Saint George or its Garrison are under different regulations from the foregoing. The Governor for the time being is always Commander-in-Chief of Fort Saint George; and in that capacity he exercises a peculiar control over such works. No buildings, or alterations or repairs to buildings, Civil or Military within the Fortress, or Military buildings in occupation of the garrison outside the Fort, can be undertaken except on previous sanction from the Governor, obtained through the Town Major. In case of any of the buildings above specified being deemed to need alteration or repair, the Officer Civil or Military in charge or occupation of it, signifies the same to the Barrack Master; who after inspecting the building, makes a report to the Town Major for the information of the Governor. And the Governor having considered the case, if he approves the work proposed, issues orders through the Town Major to the Superintending Engineer to perform the work.

Course of proceeding.

A copy of this order is sent by the Superintending Engineer to the Military Board, together with the estimate if the nature of the case is such as to require an estimate, and is the authority to that Board to direct the necessary advances for the work. If the work is thought likely to cost less than 200 Rupees an estimate is not prepared, but the Superintending Engineer proceeds to the execution of the work immediately; but though the estimate is dispensed with, he is required to send up a "Statement" as it is called, which in fact is just the same as an estimate. If the work be expected to cost more than 200 Rupees the Superintending Engineer pre-

pares an estimate and submits it to the Military Board; but even then if the work be one deemed emergent, and be ordered by His Excellency to be so executed, the Military Board immediately orders an advance for the work, and it is commenced without delay, before the estimate has been received or even prepared. If it is not of an emergent character, the commencement of it is postponed till the estimate shall have been examined, considered, and sanctioned, by the Military Board or by Government, in accordance with the general rules above detailed. In the case of works executed without an estimate previously sanctioned, the statement or estimate, as the case may be, is sent up to the Military Board sometimes several months after the work has been completed, and is then formally examined and sanctioned: after which the bill for the same work comes up for examination and sanction.

7. It thus appears that in all cases, except where the expenditure is likely not to exceed 200 Rupees, or where the work is urgent, the order of the Governor is virtually no more than directing the Superintending Engineer to submit an Estimate to the Military Board for sanction in the usual manner. To quote the words of the Town Major in his letter to Government dated March 31st 1846, "it conveys no orders whatever for the execution of the work, but merely that Estimates may be prepared and forwarded through the Military Board for the sanction of Government." This being the real meaning of the order, it might be expedient to alter its terms, so as to make them agree therewith. Some misapprehension appears to exist as to the boundaries of the authority of the Military Board and of the Town Major respectively, in connection with this matter; but the letter from the Town Major to Government of the 31st March 1846, which with the draft of rules submitted with it was adopted by Government, and sent down for the guidance of the Military Board, appears to make all essential points sufficiently clear.

The general effect of the rules.

8. Under those rules, the Governor reserves to himself (Para 7) the full power to direct the Engineer Department to make immediate alterations, repairs, &c. "to any of the Public Works" under his separate authority; and the Superintending Engineer is directed (Para 8) to proceed to the execution immediately on receiving such orders. Still it is ordered (Para 9) that where the work is not of an urgent nature, and is likely to cost more than 200 Rupees, an estimate shall be submitted and previously sanctioned, according to the general practice of the department. Further, it is provided in Para 10, that the Town Major may of his own authority order such mere "repairs to Public buildings, drains, &c. as may be urgently required;" this power however is used to a very limited extent.

The rules described.

Under the operation of these orders during the year 1852, about half the work performed to buildings &c. within the Governor's separate control was executed on sanctioned estimates, viz. Rs. 7,065-9-8 and the remainder, viz. Rs. 7,162-5-4, on emergency, and without estimate. In their despatch of the 7th April 1847, the Honorable Court directed that annual reports should be furnished to them of all work so executed on emergency to these buildings; a statement was furnished accordingly for that year by the Military Board but it does not appear that any such reports have been made since. The facility given in these orders to the prompt repair of damage to buildings, without waiting till an estimate should be formally sanctioned by a deliberative body, accords with what we shall recommend hereafter; but it appears to us unwise to dispense with the preparation of estimates except in very trifling cases. The concession of the same power in the case of alterations, is peculiar to those buildings which are under the immediate personal control of the Governor himself; upon this arrangement we need not express any opinion.

9. In the Road Department all estimates properly so called, whatever their amount, and whether for new works, improvements, or only repairs, require the special sanction of Government. But in general the whole of the mere repair and maintenance of made roads under charge of that Department, is provided for by a permanent annual allowance for each line of road; and it is the declared opinion both of the Government, and of the Hon'ble Court of Directors, that all made roads ought to be so provided for from the very time of their formation. Thus, though nominally all estimates in this Department require the special sanction of Government, yet practically that requirement is limited in great measure to the formation of new lines of road, the improvement of old lines, and the construction or extensive repair of bridges; and all ordinary repairs to existing roads and bridges are performed on the authority and at the discretion of the head of the Department, subject to a certain money limit on each line of road.

Estimates of the Road Department.

Estimates of the
Maramut De-
partment.

10. The Estimates in use in the Maramut Department under the Board of Revenue are of three kinds, Ordinary, Occasional, and Emergent; of which those of the second description require the sanction of Government while those of the other two kinds do not. The Board of Revenue has to deal with three species of Public Works, viz. the Irrigation works, the District Roads, comprising the whole of the roads of the country except the limited extent under the Road Department, and the Revenue, Judicial and General Buildings in the interior. Of these three kinds of works the estimates for the first may be either Ordinary, Occasional, or Emergent; those for roads and for buildings can be only Occasional or Emergent. In other words, the ordinary repairs of irrigation works are performed on the authority of the Collector without the sanction of higher authority; but in the case of roads and buildings the smallest and most ordinary repairs (with very trifling exceptions to be noticed below) require the previous formal sanction of the Government, unless the circumstances are such that delay would endanger the work; in which case they may be performed as emergent.

For ordinary re-
pairs to Irriga-
tion works.

11. The "Ordinary" Estimates for irrigation works are for the repair of those usual injuries and dilapidations, which, from their very nature, such works must constantly suffer or be liable to. All such mere repairs, consisting for the most part of earth work to embankments, the clearing out of channels, or the repair or reconstruction of rough stone revetments, are undertaken on the order of the Collector, subject only to the limitation that the amount of the estimate for any one work shall not exceed a year's Revenue from that work; and that in the case of masonry repairs or reconstructions exceeding 100 Rupees in amount, and of all new stone revetments, the estimate, if made by the Tahsildar's Department, shall have the approval of the Civil Engineer.

The Ordinary Esti-
mates described.

12. The Ordinary Estimates are annual. Estimates are made at all seasons throughout the year, by the Civil Engineer and his Assistant and Surveyors, for the repair of tanks and water-courses which they may find needing it. Estimates made by the Tahsildar's Department are for the most part made after the monsoon, near the end of the year or in the first two months of the following year. Soon after the beginning of each year lists are made in the Collector's Office, (one for each Talook) of all the Estimates so made by both Departments respectively, in the course of the preceding twelve months; and the Collector then determines whether the whole can be executed and if not selects for execution, in concert with the Civil Engineer, those which seem to be the most required. Till recently the lists of estimates thus ordered to be executed were sent up through the Board of Revenue for the sanction of Government. But this being a mere form, and a useless expenditure of time and labour, inasmuch as the very nature of the case made it necessary for the security of the Revenue that the work should be commenced at once, without waiting for the orders of the Board or of Government, the practice of so transmitting the estimates was discontinued two years ago; and the Ordinary estimates are no longer sent up, though they are still prepared with the same care as before.

"Occasional" Esti-
mates.

13. The Estimates styled "Occasional" comprise all new works however minute, and whether for purposes of irrigation, roads, or buildings; also all improvements or enlargements of any works. All mere repairs of works of irrigation, exceeding in amount one year's Revenue from the work, must also be done on Occasional Estimate; also all repairs of all kinds to roads and buildings with trifling exceptions. The essence of "Occasional" Estimates is that they require the special sanction of Government before they can be put in execution; none of the foregoing kinds of work therefore can be undertaken, not even the common repair of buildings in this Department, without the previous special sanction of Government in each case.

The exceptions above referred to are the following: in the case of buildings, trifling repairs not exceeding twenty Rupees in each case, may be executed by Collectors on their own authority; and in the case of roads, a small fixed sum, ranging from 300 Rupees to 750 Rupees a year, is allowed in each District for the repair of the roads at the discretion of the Collector; and some few of the passes and made roads under the charge of the Board of Revenue are provided with a small annual allowance for maintenance.

Power of the Col-
lectors to au-
thorize work.

14. The above mentioned power to authorize trifling repairs to buildings has been held by Collectors since 1832. The order conveying it does not specify buildings or repairs, but gives power to Collectors to incur necessary charges for contingencies, to the amount above stated. It has been interpreted to include repairs to buildings, and in this Department such repairs form nearly the whole of the charges incurred under the order. The extent to which in practice the privilege has been made use of is extremely limited.

The permanent allowances for the repair of the District roads generally were mostly granted in 1837, though they existed in three Districts before that time. Their amount is so very trifling that it cannot have any very perceptible effect on the roads; the total is no more than 9,800 Rupees a year for the whole Madras Presidency. The amount of all the sums allowed in the Revenue Department for the maintenance of particular roads and passes is 8,740 Rupees a year.

15. Emergent estimates as their name implies, are such as are made for the repair of sudden damage, the neglect of which would lead to a loss of revenue, or to increased injury to the structure. Estimates for such work are prepared, but the work is put in hand at once on the Collector's authority. Very strict limitations are put on these estimates: in the case of roads and of buildings it is expressly ordered that emergent outlay shall be limited to the "preservation" of the works. No consideration of the public convenience is allowed to enter. To quote the Board's Circular Orders; "the reconstruction of a Sluice or a Calingulah may be emergent, but not that of a Bridge;" on the former depends some revenue payable to Government, but the latter concerns only the convenience of the Public and of Commerce. In the case of irrigation works somewhat more latitude of meaning is allowed to the term emergent; and more ordinary repairs estimated for after the completion of the annual lists of estimates, are allowed to be included in it, if the Collector considers their immediate execution expedient, even though it may not be strictly necessary.

Emergent esti-
mates.

16. In the existing rules for the sanction of expenditure in the three branches of the department, as we have thus described them, we observe that want of harmony which might be expected from the absence of a common controlling head. But in all except perhaps the Road Department, the restrictions appear to us much more narrow than is to the advantage of the service of Government; and there is too much disposition to centralize power in the hands of the Government itself. In the Road Department a practice has been adopted which if fully carried out would secure the timely and efficient repair of all ordinary damage by the local officers, without the necessity of a previous reference to Government. In the Military Department the rules admit of the execution of common repairs within certain narrow money limits by the local authorities, and to a much larger amount on the sanction of the Military Board. In the Maramut Department under the Board of Revenue the restrictions are still narrower, as respects buildings. Every trifling repair exceeding 20 Rupees in amount, to any one of the numerous Revenue, Judicial and General buildings under a Collector's charge, requires all the formalities and delays of the transmission of an estimate through the Board of Revenue for the sanction of Government.

The powers of the
local officers are
too much res-
tricted.

17. In the case of irrigation works indeed, necessity, that is the certain loss which would otherwise ensue, has forced a relaxation of this rigid rule, and a wide latitude is given. And how striking the inconsistency here appears. The whole Ordinary estimates of the eighteen Districts having irrigation, amounted in 1850, not an extraordinary year, to more than six lacks of Rupees. On an average therefore each of these Collectors disburses annually 33,000 Rupees, without sanction. But the expenditure is not in fact by any means the same in all; and in four of the Collectorates, viz. Tanjore, Rajahmundry, Tinnevely, and Trichinopoly, the expenditure in the year abovementioned ranged from 55,000 Rs. to 78,000 Rs. Yet the same officer who is allowed to spend such large sums, nominally on his own guarantee, but in reality on that of his tahsildars to him, is not trusted to lay out more than 20 Rs. on any building; and the whole amount which he is empowered to expend on the repair of the roads of his District, (equal in size to one-eighth, and, in some cases, even to one-fourth of England,) is no more than from 30 £ to 75 £ a year. And this is the more inconsistent, because the guarantee against lavish or injudicious expenditure is certainly greater in the case of buildings and of roads than in that of irrigation works. For the estimates for the first two classes of works are most commonly prepared by officers of the Civil Engineer's Department; while a large portion of those for the last are prepared by the Talook officers; and again the irrigation works, from their large number and scattered position, are less likely to be inspected by the Engineer Department after the execution of the work, than the roads and buildings.

But are inconsis-
tently broad in
the case of irri-
gation works.

18. The interests of the Government appear to us to require that more power should be given to the local officers as to executing repairs without special sanction, and we would advocate the broad principle that all ordinary damage occurring to works of all kinds ought to be repaired with-

The rules ought to
be enlarged.

out delay by the proper local officer. We cannot see that any thing is gained by the practice of postponing repair for the approval of a distant authority, which must be incapable of exercising an intelligent judgment on the case. It is certain that wear and tear and dilapidation must occur, and that out of a large number of buildings some must every year need repair of some kind; but as to the exact damage received at any time, or the precise nature, quality, and cost, of the repair required, only persons on the spot can know. Authorities at a distance are compelled to rely on the information of the local officers on these points; subject only to general inferences deducible, as respects the repair being necessary, from the average durability of buildings and materials generally, and as to the cost, from the average cost of similar work on former occasions. This check they can and ought to exercise, so far as it can be legitimately applied; that is, always remembering that these standards are averages, and that individual cases must of necessity most commonly vary from the mean on one side or the other. We have already said in our First Report that we would increase the means of exercising this check by carefully recording all experience and so forming good and constantly improving data tables. But it appears to us that this check such as it is can be exercised to quite as good purpose after the work is done as before; and that as to cost it cannot be exercised at all before, because the cost of the work in hand is not then known.

Evils of the present system.

19. We think therefore that nothing is gained by the present practice of restricting the local authorities in this particular, and we are sure that much is lost. There is, first, the time and labour and stationery involved in copying and sending up the estimate; then, there is the loss of the time of those officers at the Presidency concerned in examining it, testing the calculations, passing orders, and reducing those orders to writing; and as some of them are very highly paid this loss even in mere money is not little. 3rd, there is the loss from the building continuing out of repair, probably not weatherproof, all the time that the estimate is under reference: and if it is admitted that the building is worth repairing at all, it must be allowed also that the protraction of its unrepaired state is an evil. 4th, is the loss by the building becoming more injured so as to need more extensive outlay at last: this must often occur through the proper season for work passing by, while the matter is under reference. And lastly is the fact that, the process of obtaining repairs being so difficult and tedious as it is, trifling damage is neglected and the injury allowed to go on unchecked, till it is necessary to repair it at a much greater cost than would have been sufficient at first.

All those evils certainly result from the present practice; and the greatest of them all is the consumption of the time of establishments already overworked, and unable to give adequate attention to important matters. This is the condition of all the officers concerned, the Collector, the Civil Engineer, the Board of Revenue and the Government; and this reason would be sufficient for discontinuing all useless and supererogatory work, even if the very fact of its being so were not deemed amply sufficient.

Delays in the repairs of judicial buildings.

20. The course at present in the Judicial Department is the most tedious and round about of all, and we will here detail it. When any one of the numerous judicial buildings in the Provinces is in need of repair, the Zillah Judge or Sub-Judge as the case may be reports the circumstance to the Court of Sudder Adawlut, and solicits permission to have an estimate prepared by the Civil Engineer's department. Having obtained this permission the Judge addresses the Civil Engineer requesting him to cause an estimate to be made for the repairs required. The Civil Engineer may be in a distant part of his extensive charge, and it may be months before he or any competent member of his establishment can visit the spot. At last however the estimate is made; it is then sent to the Judge, who sends it to the Sudder Adawlut, who forward it to the Board of Revenue in the Department of Public Works; by whom after examination it is laid before Government. Having obtained the sanction of Government the estimate is returned to the Board of Revenue, and is by them sent down to the Collector of the District, who then issues instructions to the tahsildar of the talook for its execution: the fact of the sanction by Government is also communicated direct to the Sudder Adawlut, to be made known to the Judge who originally applied for the repair. Thus in the case of judicial works, even a common repair cannot be undertaken until twelve separate official processes have been gone through in six different offices; and each one of these twelve processes occupies no inconsiderable portion of time.

21. In the case of revenue or other buildings under the care of the Collector's own department, the processes are less circuitous. If the repair required is trifling, the Collector directs a maistry to make an estimate and sends it to the Civil Engineer; who if he finds it correctly prepared, forwards it to the Board of Revenue either after personal inspection of the building by himself or not, as he may see fit. The Board after examination send up the estimate to Government for sanction, and that having been given, it is returned through the Board of Revenue to the Collector, and sent to the tahsildar for execution. If the repair required is more considerable, the estimate is made by the Civil Engineer's Department, and after countersignature by the Collector is sent up and returned through the same channel as in the former case. And with respect to both Judicial and Revenue works it must be noticed that the mere time occupied in the official processes to be gone through, though that is not inconsiderable, does not constitute the whole of the delay. The Board of Revenue have found it expedient to make it an office rule that except in special cases, estimates shall only be sent up to Government in the first and last quarters of the year; and thus it must often happen that besides having to wait its proper turn in the order of its arrival, for the attention of an overworked office, an estimate is laid aside entirely during the six months that the office is occupied with bills.

Of Revenue Buildings.

22. In the Military Department the steps towards obtaining the repair of damage other than petty repairs are no less tedious and circuitous than in the judicial. The Officer in charge of the building applies to the Officer Commanding the Station, who forwards the application to the Officer Commanding the Division. The latter then submits it to the Commander in Chief through the Quarter Master General, who communicates it to the Military Board. The Board then, according to the nature of the case, either orders the Division Officers to execute the work on emergency, or calls on the Division Commanding Officer for an estimate. The latter Officer, then, if beyond the Frontier, directs the Superintending Engineer to examine the building and make an estimate for the necessary repair; or if within the Provinces (where he has no Engineer Officer at his disposal,) he requests the Civil Engineer of the Division to do so when he may be able. In either case, the estimate when prepared is sent by the Engineer to the Officer Commanding the Division, who forwards it to the Chief Engineer at the Presidency, who after examination transmits it to the Military Board; and that Board either pass it themselves if the amount is within 500 Rs., or send it up to Government if it exceeds that amount. It is then returned through the Board and the Divisional Commanding Officer to the Superintending Engineer or the Station Staff Officer, as the case may be, for execution.

Of Military Buildings.

23. All churches and other structures belonging to the Ecclesiastical Department, wherever situated, are as regards their repair and conservation under the direction and control of the Military Board; but as already noticed they are subject to different rules from the buildings under that Board generally. The course in their case is as follows. Whenever a repair is required, no matter how trifling, though it should be only the breaking of the bar of a door, the starting of a bolt socket, or a few bits of plaster falling off, (as in the church of Trichinopoly in March last,) the special sanction of the Governor in Council must be obtained before any steps can be taken to remedy the injury. The Chaplain or the Church Trustees, it is not clear to which the duty belongs, brings the circumstance to the knowledge of the Bishop, or at times when he is absent from the Presidency, of the Archdeacon. One or the other of these dignitaries, as the case may be, then addresses the Chief Secretary, requesting him to lay the circumstances before Government and obtain their sanction to the repair. An order of Government then issues to the Military Board either directing them to take measures to execute the work applied for, or to report upon the application. In the former case if the work is trifling in its nature the Board send orders to the Superintending Engineer of the Division to perform it on emergency, or if it is more considerable, they require him to submit an estimate through the Chief Engineer, which when received is disposed of under the general rules. If the Government order directs the Board to report, they call for an estimate and report from the local Engineer and then make their own report.

Of Ecclesiastical Buildings.

24. Thus tedious and numerous are the processes which must of necessity be gone through under the present system, previously to the execution of the most simple repairs to buildings, (if they exceed a very trifling amount,) even where there are no errors in the estimate or the reports, and the information supplied is deemed sufficient. But where any such errors occur, or where fur-

Any informality greatly increases these delays.

ther explanation is thought necessary, to use the words of the Military Board's Secretary "the cross-fire of correspondence that has to be carried on can be more easily imagined than described."

The system by which repairs in the Ecclesiastical Department are taken out of the operation of the general rules for works under the Military Board, is of no earlier date than 1848. The order of Government enjoining it, (August 1, 1848 No. 230,) gives no reasons for the change, and we are not aware of any. The present practice seems to us to cause much useless trouble, and to delay undeniably necessary work, without any compensating advantage; we beg to recommend that whatever course shall be adopted in the case of repairs generally, the same should be made applicable to those in the Ecclesiastical Department also.

25. In all the foregoing cases much delay of necessary repairs, and much waste of labour and of stationery, would be avoided, if the proper local officers themselves were empowered to authorize the immediate execution of repairs, on estimates duly prepared by the Engineer Department. And on the consideration above set forth, viz. that wear and tear must inevitably occur, that it must be repaired, and that whatever processes may be interposed, the outlay must after all be incurred on the information of the local officers, it is our decided opinion that this course ought to be adopted. It cannot be denied that promptitude in repairing damage is very desirable in itself, and a private person who should allow months and even years to elapse after repairs became necessary to his house before performing them would not be thought to act wisely. But it will be said that the case of a person acting for himself, is different from that of servants acting for their employer. It becomes then a question of the degree of trust that may safely be reposed in the local authorities. But in point of fact they are necessarily relied on already in all stages of the matter except the single one of authorizing the outlay, the information on which the higher officers act in authorizing it is entirely their's. Is there reason to believe then that if this last power were conceded also, the trust would be abused more than that already reposed in them? There is abundant reason, we think, for giving a negative answer. As to the Collectors, they are already vested in the case of the irrigation works, with a vastly larger measure of power than we propose now to give them. And as to the Military authorities, their operations under the powers vested in them by the orders of 1849, clearly shew that the danger would be not a lavish or careless expenditure, but too great backwardness to act on the power placed in their hands.

26. And it must be added that the check on the misuse of the power would be greater and more effective under the organization of the department which we have proposed than it would be now. Under that system the estimates would invariably be made by the department of the District Engineer or the Executive officer as the case might be; they would be examined and approved by the Inspecting Engineer of the Division, and his approval without which they could not be executed, would supply that check by an independent officer, unconcerned either in the occupation of the building, the preparation of the estimate, or the execution of the work, which is now afforded, more cumbrously but less effectually, by the direct interference of a distant Board at the Presidency.

And our proposed system provides another check which does not exist now; viz. in the annual reports to be made to the Board of Works, (see 1st Report, para 226.) These annual reports will bring under systematic review, in a connected aspect, all the operations of every officer concerned in the charge or the repair of Public Works of all kinds; as to the repairs in particular, they will set forth the necessity for them, their nature, their amount, and other particulars. And we must reiterate the opinion which we expressed before, that such annual reports, their review by the Board of Works, and their submission by that Board to Government, will furnish a check of a more effective kind than can possibly be afforded by the submission of every estimate for the sanction of the Board and of Government. Such a course withholds indeed from the controlling bodies that direct interference in every individual case, which habit may bring men to regard as the legitimate function of a Government; but on the other hand it gives them a general bird's eye view which no interference in detail can afford; and while, by allowing independent action, it draws forth the energies of the local officers, it lays them at the same time under a direct and efficient responsibility.

27. In Bengal the practice which we are advocating has been many years in operation, to this extent that no estimates for repairs require the sanction of Government. The difference is that there the power of sanctioning the greater part of such estimates is vested in the Military

Repairs ought to be left to the local officers.

There would be no danger of abuse.

Additional guarantees under the new system.

The annual reports.

The practice in Bengal.

Board; the power of the local officers being limited to petty repairs, according to the practice introduced here in 1849, though we believe the money limit there is somewhat higher. For the reasons already stated, we are of opinion that there is no good reason for this limit; and we cannot but think it very desirable that the local officers should be vested with the power of authorizing all mere repairs, although we are by no means sure that they will in general be ready to avail themselves of it.

28. Supposing this power to be given to the local officers, some rules will of course be proper, both as to the nature of the work to be included in the term "repairs," and to the amount permitted to be expended. We will offer some remarks on both these points.

As to the nature of the work, the meaning of the term "repairs" should be accurately defined. In the case of buildings, in all the departments, we would confine it strictly to repair properly so called; to the work necessary to the maintenance of the building in good condition, and to its full usefulness as it was when built or last repaired, but without any increase of convenience or accommodation, or any additional ornament or finish which it had not before. We would rigidly exclude all work of the nature of alterations, additions, and improvements, because we think Government may properly reserve to itself the decision as to the necessity or propriety of providing all such; and that all propositions of that nature should be brought under its notice for that purpose in the same way as new works.

29. As to the money limit; the outlay on any one building might properly be restricted to some per centage on the value of the building; and every building ought certainly to have a valuation affixed to it in the books, as is the case now with those under the Military Board but not with those under the Board of Revenue. The existing rules empower the Military Board to sanction repairs to buildings as far as 10 per cent on their official value, provided the total does not exceed 500 Rupees. This per centage however is found too small in practice, and that part of the rule therefore is not adhered to. We would propose that the limit to repairs should be 25 per cent of the official value of the building; if the required repair exceed that proportion, it should be regarded not as a repair but rather as a restoration, and the case should be referred through the Board of Works for the sanction of the Government.

30. No other sort of limit to the expenditure than this seems necessary or expedient. It may be thought that it would be proper to fix a standard expenditure; but that appears to us objectionable in this case. It is certain that the repairs needed, those which in the absence of artificial restriction would be executed, must fluctuate much from year to year: on referring to the statement given in Appendix X. of our First Report, of the actual expenditure for twenty years under the Madras Military Board on new works and on repairs, we find that the amount of repairs varied sometimes as much as 50 per cent. in two consecutive years. And if this is the case over the whole Presidency, much greater would be the fluctuations in single Divisions or Districts. Such being the case, a standard sum, if moderate in amount would prevent proper expenditure in some years, and probably lead to extravagance in others, from a supposed necessity of keeping up to the standard; if it were high, a maximum sum, it would certainly operate largely in this latter mode.

And it does not appear to us that in the case of buildings any such limit is required. The buildings are not numerous, they are generally in fair repair, or else (as in the case of some revenue buildings, Talook Cutcherries &c.) are so far gone as to need reconstruction, so that they would not come in under repairs at all. The use of a limit is to prevent the expenditure being so large in any one year as to embarrass the finances: but under the circumstances just stated there seems no reason to fear that this could ever occur in the case of buildings, and no occasion appears therefore for a limit. And as it is for the interest of Government that all the repairs should be performed as soon as found necessary, we recommend that there should be no restriction in this particular.

31. As respects the roads, the repair and maintenance of all made roads should be provided for by a permanent annual allowance. This would cover all ordinary repairs, and no further limit either as to amount or nature of work to be done would be necessary.

32. With respect to irrigation works, the rules as to the nature of repairs might remain very much as they are at present in their general bearing; but it seems expedient to give a somewhat

Some rules would be proper.

The nature of the work.

The amount.

No other seems necessary.

A permanent allowance for Roads.

In the case of works of irrigation.

broader meaning to the term repairs than is expedient in the case of buildings. Instead of defining it as at present by excluding certain kinds of repair, we think the best course will be to look primarily to the efficient condition of the work. In this view we think that the proper line will be to admit as repairs all such work as may be designed and adapted to maintain the tank or channel in a state of full efficiency or restore it to that state; but not such as may be designed or adapted to extend its irrigation to new tracts, never before watered or intended to be watered by it. So understood, the term repair would often include the forming a new head to a channel, or taking it further up the parent stream, or adding a cistern to a sluice which before had none, and even to the construction of a new sluice, where it might be necessary for the due distribution of the water of a tank or a channel; or of a new calingulah, when it might be required to enable a tank or channel to retain with safety a full supply of water. Here however it might be proper to impose some limit; and we would propose that no new sluice or calingulah or other masonry work should be admitted into this class of estimates, if expected to cost above 500 Rupees.

This restriction would be sufficient.

33. We are aware that this definition would be somewhat ambiguous, and liable to some variety of construction; but this appears to us much better than to attempt to tie officers down by precise and minute and artificial rules which would be sure to operate in modes and directions not intended, and which probably after all would not effect the object aimed at. It must be remembered that with an efficient establishment and with that organization of the executive which we shall propose in our next section, the works will be in the hands of intelligent and honorable officers, well capable of judging what is required, and worthy of full confidence; and that with that distribution of duties among three different departments which we shall advocate, there will be ample checks against errors of judgment, or even jobbing, in any one. Having such agency on the spot, it appears to us the part of true wisdom to take advantage of it by allowing the local officers full scope to act; especially since even if they should exceed their power, which we will repeat it is contrary to experience to expect, the Government will gain by such over-zeal.

The money limit to be enlarged.

34. Thus much of the limitation as to the kind of work to be admitted as "repairs" in the case of irrigation works; next as to the amount. Inasmuch as all the irrigation works in the country may be said in the general to be more or less out of repair, the outlay on the repairs ought to be increased. And as it seems expedient that every work taken in hand should at once be put in thorough repair, it seems proper to enlarge the money limit to the outlay on any one work, from the amount of one year's Revenue to double that amount, viz. double the highest revenue within five years. It is probable that it would rarely be necessary to lay out so much as this; but it will be well to give the power in order to prevent the work being done inefficiently.

The total to be limited.

35. It may be proper also to place a limit on the total outlay in any one year in each District. If the works were already in good repair, it would be better to omit any such limit, and to perform repairs every year as they might be required, as already suggested in the case of buildings. But this is not the case; the great bulk of the works are out of repair, so that most of them need to be brought up into a state of full efficiency, and this must of necessity be done gradually. In our first Report we noticed this circumstance, and recommended that a certain sum (fifteen lacks) should be devoted to the task of maintaining the irrigation works, and gradually bringing them up to a state of complete efficiency; and if that proposal is adopted, it will be necessary to carry out the measure by establishing a limit in each separate district. This limit should be fixed with reference to the number of works in the district and their state of repair, rather than with regard to the past expenditure there; because the irrigation has been neglected in some collectorates much more than in others, and the works in such districts are consequently in much worse order. The sum assigned in each case would form the standard of expenditure; it should not merely be regarded as the limit, but inasmuch as it would be the amount supposed to be required for the development of the resources of the district, it would be the duty of the Board of Public Works, to enquire the cause if in any district the expenditure should be habitually much below it; and if that cause should be found to be the indifference of any of the local officers, to apply a suitable remedy; or if it should be that the amount assigned was too large, then to transfer a part of it to some other district where it might be more wanted.

The annual lists of Estimates.

36. Another question connected with these repairs is whether the present system of making out an annual list of the estimates should be continued or not. We have explained already that

such a list is made out within the first three months of every year, containing all the estimates made since the date of the preceding year's list. And it results that many of the estimates are six or eight months old, and not a few much older, before they are even ordered to be executed. The use of these annual lists was suited to the practice of submitting the Ordinary estimates for sanction; it made the controlling Board acquainted with the whole amount of the proposed expenditure for the year, and it saved the submitting of frequent estimates or lists of estimates. We say it suited the practice of submitting the estimates for sanction, but it was not necessary to it; and looking at the time when the annual lists originated viz. when first the Maramut expenditure began to be at all supervised, it seems probable that the arrangement was adopted as a convenient one, with but little care to enquire whether it was the best, or whether it involved inconveniences; and the question seems never to have been raised since.

37. In considering it now, we regard the practice as objectionable, because of the delay which it occasions in the execution of repairs, and because it causes the loss of some of the best working months in the year. Six or eight months often elapse as already said, after the estimate is made before it is even ordered to be executed, and in the meanwhile a mousoon will have passed, and probably have augmented the damage. Again it is found in practice that however the preparation of the lists may be hurried, they are seldom completed much before the time allowed viz. the end of March; and as orders for commencing work are only given after the lists for a talook have been examined and decided on, it is generally the end of February and often of March, before the order is given, and of course it is much later before work really begins. There seems no good reason for this: the same considerations which make repairs proper at all make it proper to execute them without delay; in other departments a repair found necessary is never intentionally or systematically delayed till the following year, and we fail to see why it is more reasonable to do it in the case of repairs to irrigation works than to buildings or roads. In short we are at a loss to know why these annual lists are more proper in this case than in the others; we propose to abolish them as useless and pernicious, and we would allow repairs, to irrigation works as to other works, to be undertaken as soon as found necessary. Estimates made would be sent by the District Engineer to the Inspecting Engineer for examination; and having been found correct by him would be sent to the Collector for approval and countersignature, and would then be returned to the District Engineer, to be executed as soon as he could make arrangements to undertake them.

They are inconvenient, and should be abolished.

38. One effect of giving more latitude to local officers as to repairs generally, would be almost to extinguish the class of "Emergent Repairs;" for almost all now called such would be done in the ordinary course. The exception would be that occasionally in the event of sudden damage to irrigation works, as the breaching of a tank or a channel, the District Engineer would find it expedient to put the work in hand without waiting for the approval of the Inspecting Engineer and the Collector. It would be necessary to give him this power; and it should be made the duty of the Collector to issue money on such occasions on the responsibility of the District Engineer; cases of this kind would probably be but few.

Emergent repairs would almost cease under the foregoing rules.

Full license should be given however to the speedy repair of tanks breached. This is essentially necessary, not merely to secure the Revenue from the tank, which otherwise must be sacrificed for at least one year, but as a matter of justice to the Ryots; who, where the repair is postponed, find the value of their property in which they had invested their capital and labour on the faith that the irrigation would be maintained, suddenly reduced almost to nothing. On this subject we beg to refer to Para. 276 &c. of our First Report. Whether under the term "Emergent" therefore, or under any other, adequate provision should be made for the prompt repair of breaches occurring in tanks and channels, by the local officers, without the delays incident to references to higher authority. In general indeed our proposed rules for ordinary repairs would include such cases; but it would occasionally happen that the cost would exceed two years' Revenue from the work.

39. Before closing our remarks on the ordinary repair of irrigation works, we ought to notice a practice apparently peculiar to the district of Tanjore, and certainly not general, which very much swells the number of estimates for works of this kind, and greatly increases the labour of all the offices concerned, without any compensating advantage. When a channel watering

A practice in Tanjore, which needlessly and very greatly increases the number of estimates.

twenty, thirty, or a hundred villages, is to be cleared out, instead of a single estimate being made for the whole work, a separate estimate, and finally a separate bill, is prepared for the work to be done in each one of the numerous villages through which the channel passes, or which share in its irrigation. The irrigation of Tanjore is furnished almost wholly by long channels, each of which waters many villages; it is obvious that the practice in question must very greatly increase the number of estimates. The ordinary list for the District for 1848 contains 1288 separate estimates; but we find that 973 of these are for only 95 distinct channels, being more than ten estimates to each. And in almost all the other cases the channel is put down without a name, so that it cannot be known how often the same one occurs. In other districts the whole repairs of a channel are treated as a single work, as they really are: it seems highly probable that if this were done also in Tanjore, the number of estimates and of bills would be reduced to one fifth of the present number. In Tanjore there are no "tank diggers" by caste and calling, but all Maramut work is performed by the cultivating labourers of the Meerasdars; and the people of the several villages receiving water from a certain channel execute the repairs required to it, in shares having the same ratio to the whole work to be done, that the cultivation of their village bears to the whole cultivation under the channel. The practice on which we are remarking was probably introduced to suit this custom; but it is by no means a necessary consequence of it. The custom might continue intact, although the whole estimate for a single channel were regarded as one in the Government accounts, as it ought to be.

Very little "Ryots' repair" appears to be done in Tanjore.

40. Another circumstance attracted our notice in the examination of the Tanjore estimates, viz. the extreme smallness of the amount of the outlay in a vast number of instances as compared with the revenue yielded. Out of 1129 ordinary estimates made by the tahsildars for the year 1848, there were 277, to the aggregate amount of 6,340 Rupees, under 2 per cent of the revenue yielded by the channels respectively, and ninety two of that number were under 1 per cent on the revenue concerned.

The Government have lately had under their consideration the obligation of the Ryots to perform minute repairs to the works of irrigation, which are a source of wealth to them not less than of revenue to the state; and have expressed the opinion that this practice ought to be enforced. It appears however that in Tanjore, the most wealthy, the most thickly peopled, and the most lightly assessed district under this Presidency, the Ryots do less in this way for themselves than in almost any other district. In earlier times there is no doubt that very much of this sort of work was done gratuitously, and the practice at the present day of portioning out the work to villages, and to individual Meerasdars, according to their extent of irrigation, may be regarded as a remnant of the custom; but in process of time the Meerasdars have been able to establish the custom of paying them for all such work.

A composition or contract might perhaps be made with the Meerasdars.

41. The custom being established it would be difficult to break through it; but the question arises whether it would not be better to make a composition with the Meerasdars, allowing them a trifling reduction from their assessment, on the condition of their performing all the work necessary to keep their channels clear. In the Tanjore district the actual experience of many years past would show the amount of accumulations periodically requiring to be removed, and the per centage of the cost to the revenue might be easily calculated. Probably it would not exceed one per cent per annum; and if the rate were calculated fairly, precisely the same amount would be saved in expenditure. Such a change would be of vast benefit in relieving the officers of Government from an enormous mass of petty details, and restricting their duties in connection with such work to inspection and the enforcement of timely repair, a duty which would easily be performed by an effective department. And even if it should be found impracticable to come to such a composition in Tanjore, in the face of the established usages, it seems well worth consideration whether this system might not properly be adopted with reference to the minor channels of distribution, (for of such only we are now speaking,) in connection with the irrigation of the Deltas of the Godavery and the Kistnah.

There will be an efficient check on injudicious or improper repairs.

42. In thus recommending that repairs should be undertaken on the responsibility of the local officers, we must add that it is not by any means our intention that work of this kind should be absolved from strict supervision. That supervision would be exercised in a different way, but it would be in no respect less minute than it is at present, and it would be more real. The existing

general rules for testing the necessity of repair would still be observed; but more effectually, because by an officer on the spot instead of by a distant authority at the Presidency. Thus, for example, it is now necessary to state in an application for repair, when the building, tank, or other work was last repaired, and to what amount, and what is the necessity for the repair sought. It should still be the duty of the Inspecting Engineer to attend to that rule, and to take care that expense for repair should not be incurred without necessity; and where repairs might be really required within a short time after a former outlay on that account, it would be his duty further to enquire and ascertain the cause, whether from the former repairs being incomplete, or from their having been badly done. So also the same officer would be bound to enforce the rule that whenever a building or other work is to be repaired, the whole of the repair necessary shall be stated; in order that it may be known at once what outlay will be required, and that frequent expenditures may not be incurred for the same building.

43. Further the Inspecting Engineer should make an annual report on repairs, and this should not be a bare list of works repaired, but should specify all instances in which under the foregoing two rules or any other, irregularities have been met with. And in order to enable himself to perform these duties, an Inspecting Engineer should take frequent opportunities of personally examining the buildings and works in his division. We fully believe that under a system such as this, and the Engineer being made to feel that these duties are to be really done, and are not to be allowed to become mere matter of form, the Board of Public Works will have far better means of guarding against injudicious or improper repairs, than at present, when their means of becoming acquainted with irregularities are so defective. The Board should also make an annual report to Government on repairs; submitting the reports of the Inspecting Engineers with their own observations.

Annual reports on repairs.

44. Thus much of repairs: we are of opinion that on every account viz. for the speedy execution of necessary work, to relieve controlling offices from useless labour, and to place responsibility on the right parties, all repairs ought to be left to the local officers. New works, improvements, and alterations, form an entirely distinct class; we have already stated our opinion that in the case of buildings in every department of the Service, the present rule should be maintained which places the decision on all proposals of that kind in the hands of the Government only. One modification we would propose. At present, in the Military Department though not in the Civil, no estimate can even be made for any work of this description however trifling, without a special order from the Government. This is a good rule in the case of the more considerable works, and especially of new works, because it prevents the loss of time of preparing estimates and plans for projects not eventually approved. But in the case of smaller works, and especially of mere improvements or extensions, the opposite appears to us to be the case; we think that here the observance of the rule causes waste of labour as well as of time, through the double reference necessary. We would propose therefore that in the case of improvements and extensions likely to cost not more than 200 Rupees, an estimate for the work should accompany the application for permission to perform it.

Applications for new works or improvements.

45. With respect to roads, the rule which reserves the decision to Government only, seems to us to require some relaxation. In answer to our circular query on this point almost all Collectors expressed a decided opinion that this would be a very great means of advancing improvement; and spoke strongly as to the ill effects of the present system on the interests of the Government as well as of the Ryot and the Public, though some take a wider view of the subject than others. The remarks of Mr. R. N. Malby, Collector of Canara, appear to us so just, and so nearly represent our own sentiments, that we will extract them here in full, and beg to recommend them to attentive perusal. "I believe that the greatest benefit would result from a very great extension of the powers now vested in Collectors to expend money upon works of public benefit without waiting for previous sanction. I scarcely know how to account for the gradual process by which officers entrusted with the charge of extensive provinces, responsible for revenues of vast amount, and to whom the people naturally look up for aid and encouragement, have been deprived of all power of effecting any good except by a process so tedious and so discouraging that it must gradually repress the zeal of the officer, at the same time that it diminishes the respect of the people. I imagine that there is not a bailiff of any large landlord in England who has not more power to advance his master's interests by a new drain or the construction of a new

The local officers should be empowered to authorise improvements to roads.

"path, than is intrusted in Madras to a highly paid officer supposed to be competent to watch over the interests of nearly a million of people, to manage a yearly Revenue of £ 300,000 and to correspond with Government on the most important subjects connected with the peace and the fiscal interests of his Province, and who is after all, the person by whom the Government must be guided in many most important points. It is almost impossible to overstate the effects of this system, which is the more humiliating when we see those entrusted with the charge of our newer territories, Mysore for instance, able to effect in them improvements which are at least equally due to our older and long neglected provinces. It must arise partly from a want of local interest, and a tendency to believe that money must be misapplied which is laid out where we shall never witness the result; and from a gradual system of centralization.

"I am very far from advising a careless expenditure of the public money; I would have every sum most carefully accounted for, and yet am not so sanguine as to think that money would not sometimes be misapplied; but even this would be far better than the present system, and the interests both of Government and the people would on the whole be very greatly advanced.

"I am scarcely competent to say what limits should be assigned to the power to be entrusted to the local officers; but I think it should be attempted to adjust it as far as possible to the circumstances of his charge, and that it should have a progressive and a local character. In this district for instance I think that two rupees on every garce of salt sold, the ferry farms, and the anchorage dues, should be placed at the disposal of the Collector for improving and increasing the district roads and bridges, leading to the salt cotays and to the seaports. With respect to other works, the Collector might be allowed to expend on Occasional works a sum not exceeding 500 Rupees on each, to an amount not exceeding a given per centage of the net revenue of his district.

"In this district the people are ready to co-operate with the Collector in the improvement of their roads to an extent which I have not seen elsewhere; but their zeal as well as that of the Collector soon languishes in the long interval which must now occur between the planning of a small improvement and its execution."

46. It may be difficult for persons at the Presidency to realize the full effect of the want of local power of action, in preventing improvement. But none we think can fail to see that such must be the tendency of a system which requires that in every small local improvement full details on all points should be set forth so as to satisfy a distant authority, of necessity greatly ignorant of the local circumstances and wants, and it must be added, rarely very much disposed to receive such propositions with favour. The labour of all this, added in many cases to lengthened explanation where the first information is deemed insufficient; the doubtfulness of success in the application, even after all the trouble taken; the certainty of the delay which at least must inevitably occur in the mere routine of office, even though no misconception, or call for explanation or other unusual cause of delay should intervene; the recollection of past refusals, on the plea that Government is not satisfied that there are officers to superintend the work, or that the state of the finances requires parsimony, or that if the work proposed were really required or likely to be profitable, it would have been no doubt undertaken many years before; all these feelings and considerations combined, so effectually operate to repress zeal, that all the Engineers and Collectors except those of the most sanguine and energetic character, learn after a few years to submit to see things go on as they are, and to be content to allow the most promising opportunities of improvement to remain neglected, from a conviction of the hopelessness of attempting amendment.

47. Even the members of the Board and of the Government may form some idea of this, by considering the effect upon themselves of the necessity of submitting large projects of improvement to a distant and indifferent authority in another Presidency. The chilling way in which such recommendations are received, and the slight pretexts on which they are refused, by that authority, do certainly tend very greatly to discourage such applications; just so do the restrictions on the free agency of the district officers, only in a higher degree, because they are not limited to a few cases of magnitude, but extend even to the very smallest. If it be the intention of the authorities to throw impediments in the way of improvement, as a thing evil in itself and only to be tolerated so far as it is unavoidable, the present system is well suited to the object; but if it is admitted that improvements in the means of transit and of irrigation are desirable and ought to be promoted, then it ought certainly to be totally changed.

The discouraging effect of the present restrictions.

Illustrated by comparison.

Indeed the Government itself seems to be now aware of the expediency of allowing some additional power to the local officers, for they have lately signified their readiness to augment the very small sums now given annually, as already noticed above, for the repair and improvement of the district roads.

48. We would propose then that a certain sum annually should be placed at the disposal of the Collector in each district for the improvement of the roads. As regards the amount we will not attempt to give a very definite opinion. We differ from Mr. Malby, and think that it should not be determined with reference to the revenue of the district, either the whole or any branch of it, because the wants of the several districts are not at all in proportion to their respective revenues. Thus Tanjore is a small district of 4000 square miles, which in consequence of capital invested by the Ruling Power during a succession of ages in bringing water to its lands, yields a revenue of nearly 50 lacks annually, and has between 500 and 600 miles of road in fair order compared with those of other districts, and a multitude of bridges. Cuddapah is more than three times the size of Tanjore, and yet yields only half the amount of revenue, although a Province of very great capabilities; and though equal in extent to one fourth of the size of England, and containing a million and a half of inhabitants, and though the surface of the country is peculiarly bad for traffic, it has only twenty two miles of made road throughout its whole extent, and scarcely any bridges. Similar discrepancies are met with every where; and therefore it is our opinion that the amount to be allowed in each district should be determined rather with reference to its population compared with its area, and the actual condition of its roads at present, than from a mere regard to the amount of revenue which it now yields. We abstain from offering any scheme of distribution, but we would say in general that it appears to us that from 8,000 Rupees to 12,000 Rupees may be most beneficially placed at the disposal of the Collector of any district to be expended on the roads; and we would impose no other restriction on the employment of it, than that no bridge should be built out of it to cost more than 400 Rupees.

A certain sum to be at the disposal of the authorities in each District.

49. The fund would be at the disposal of the Collector, upon whom would rest the responsibility of determining its expenditure. But he would of course confer with the Engineer Officers. Every estimate also, (under the new system to be proposed in the next Section) would be made by the district Engineer, and prior to execution would be approved by the Inspecting Engineer. These three officers therefore would thus form a species of Committee, and being all of them acquainted with and interested in all parts of the district, they would be less likely to favour particular localities, than a Committee formed of the residents of any one station. And besides the guarantee afforded by this arrangement, the annual reports both from the Collector and the Inspecting Engineer would in this case as in that of repairs, afford the Board of Public Works and the Government an excellent means of closely supervising the proceedings of officers under the power thus proposed to be conferred. And admitting that an instance might sometimes occur, in which the money had not been judiciously laid out, and so long as man is fallible mistakes must be made where there is any action at all, still we say with Mr. Maltby that it is far better both for the Government and for the Public at large that there should be such failures, than that all improvement should be impeded as it now is.

The disposal of it in whom to be vested.

PART II.—THE FORMS OF ESTIMATES, AND THE DEGREE OF DETAIL WITH WHICH THEY SHOULD BE PREPARED AND SHOULD BE SENT UP TO THE CONTROLLING AUTHORITIES.

The general form of the Estimates at present.

50. Having thus noticed the various descriptions of estimates in use in the several branches of the Public Works Department, and the power of sanctioning outlay on estimates vested in the different authorities, we come next to consider the estimates themselves. We shall explain their various forms and the mode in which they are dealt with by the several controlling authorities; and as before, we shall suggest such changes as seem to us expedient. Some estimates, especially those of the Revenue Department, appear to us susceptible of much improvement in form; we shall therefore give in our Appendix the forms which we propose for general use in the Department, and shall offer a few remarks upon them.

First, then, of the forms of the estimates now in use. The general structure of all estimates for work of all kinds in all the three branches of the Department is the same; viz. they specify the measurements of the work to be done in each item, giving the product in cubical or superficial contents, as the case may be, the estimated cost of a given quantity of each on certain recognized data, and the total cost of the whole quantity at that rate. There are a few items which do not admit of being thus described and valued by their contents; and these are set down individually according to ascertained data. The totals of all these sums form the whole amount of the estimate.

Under the Military Board and also in the Road Department this simple form of estimate is universally and strictly adhered to, all matters necessary to be stated besides the mere details and cost of the work proposed, being given in a letter accompanying. But in the department of Public Works under the Board of Revenue the estimates are required to contain a variety of particulars which have no connection with the work to be done; and it is also the practice to send up many estimates in one statement.

The forms in the Revenue Department.

51. There are five forms of estimates in the Revenue Department, viz. two forms of "Occasional" estimates for works of irrigation, called the "long" and the "short" form; the former being employed in the case of new works or considerable improvements proposed, and being designed to show in full detail the Revenue incidents of the project, and the other being used in the case of less considerable works. A third form is for the repair or the construction of buildings, and a fourth for the repair or the construction of roads; the remaining form is for the ordinary repair of works of irrigation, as well as for emergent repairs both to works of irrigation and others.

The short form for works of irrigation.

52. The short form of the occasional estimate for works of irrigation is used where the primary object of the work in hand is not to increase the Revenue but to maintain it, with usually some incidental likelihood of increase also. The form of this estimate is not encumbered with the extraneous matter of the "long form," but still it is inconvenient in several respects. In the first place, being designed to contain a number of estimates in succession, it has columns for the talook and village which would properly come in the heading; secondly, place is provided in it for information as to the cause of the work being proposed, although this is given also in a separate report always from the Civil Engineer, and sometimes also in one from the Collector besides; it also contains two columns to show the present Revenue and the expected increase, which properly have no place in an estimate for work, and both which particulars are invariably given in the separate report; and lastly it provides separate columns for the different sorts of work to be done, whether earth work, rough stone, masonry, &c., which increases the size of the document without in our opinion any compensating advantage. This form contains seventeen columns; in the simple form of estimate the number is reduced to nine, and that we have no hesitation in declaring, with increased perspicuity and convenience.

53. The "long" form of occasional estimate for works of irrigation was adopted in March 1853 agreeably to an order from Government, to be used in all cases of new works of irrigation, or material improvements, designed to increase the Revenue. It contains forty four columns, of which only twelve have any immediate connection with the work contemplated.—Those twelve columns give in abstract precisely the same information given in the "short form" of estimate, which is always required to be sent up, in addition to the "long form." Of the remaining thirty two columns, three describe the locality, while no fewer than twenty nine, or two thirds of the whole, relate to matters connected with the Revenue from the work actual and possible. Indeed it is altogether a misnomer to call this document an estimate at all; it is rather a comparative statement of the probable cost and results, but the form being invariable for all works, a great proportion of the columns in it are blank in every case. Some of the revenue details given in it are properly required, to enable the Government to form a judgement on the project; but in addition to this very voluminous "estimate" two special reports on each such project are required, one from the Collector and one from the Civil Engineer; and nothing can be stated in either of those reports without repetition of what is given in this estimate. This repetition appears to us to be only an evil. The attempt to crowd into one table so many incongruous details, only a few of which are usually incidental to any one work, forms a document most awkward and inconvenient to deal with, from its great size, (four feet broad from right to left, and of indefinite length, according to the number of works in the statement) from its being full of creases and doubles where folded, so that it will not lie smooth, and from its being torn and broken, as it speedily becomes in the course of handling. The whole of its contents are superfluous, as the same particulars are supplied also by other documents. We strongly recommend that it should be abolished; care being taken that the explanatory letter should fully detail the circumstances of the proposed work, as indeed is the case even at present.

The long form for irrigation works.

54. The form of estimate for the construction or repair of buildings in this department, is very similar to the foregoing. Like that it is suited to a list of estimates; it therefore contains separate columns for showing the necessity of the work, and the authority by whom it is recommended, as well as for the name and place of the work itself. It thus contains fifteen columns instead of nine; and is necessarily prepared on large sized paper. As respects the work itself these estimates contain neither more nor less information than is wanted. The simple form of estimate is however, in our opinion decidedly superior.

The form for buildings.

The objections to the form of road estimate used in the Revenue department are in general the same as to that last mentioned; viz. it is designed for a list of estimates, and therefore separate columns several inches wide are provided down the whole length of the estimate, to show particulars which might be given in the heading. This form is specially inapplicable to road estimates, because each one is usually of considerable length, so that in point of fact, two estimates are rarely put in one list. The form also contains other unnecessary columns. As a consequence it is printed on very large paper, occupying in breadth two pages of medium; with all the disadvantages already noticed as attending the use of large and thick paper in correspondence. Estimates for bridges, road dams, &c., are given as an appendix to the main estimate as in the road department also. This arrangement is necessary for perspicuity.

For roads.

The estimates for the ordinary repair of works of irrigation, as well as for emergent repairs to works of all kinds are in no settled or invariable form, but are usually brief, specifying the necessary particulars of dimensions, rates, and total cost. The work under estimates of these two classes is undertaken on the authority of the Collector, and the estimates therefore do not come to the Presidency Board. Formerly, a list of the ordinary estimates of the year in abstract was sent up to the Board of Revenue and Government; but it was discontinued two or three years ago, as being quite useless.

For the repair of irrigation works.

55. The chief causes which have led to the introduction of the awkward and inconvenient forms of estimate used in this department are two; viz. the wish to bring into the estimate a variety of details quite unconnected with its proper object; and the practice of including a number of estimates in one list. We are decidedly of opinion that for the sake alike of perspicuity, expedition, and facility of examination, the practice ought to be altered in both these particulars. We think that an estimate ought to be an estimate only, and that the other details now required to be shown in such documents ought, so far as they are really necessary, to be given separately.

An estimate should be an estimate only.

A cumbrous and voluminous paper, such as the long form of estimate as we have described it, is a most awkward and unwieldy document; it not only causes much loss of time to all officers having to examine or consult it, but also we fully believe deters from a close inspection any but an officer of the most resolute perseverance. And the same remark is true in a degree of all the estimates in the Revenue Department. So also we think that as a general rule every estimate (by which we mean the estimates of every single project) should be sent up separately; this appears to be the actual practice even now to a great extent; and that being the case there is the less objection to making it the invariable rule, and abolishing the inconvenient forms now in use, and adopted to suit the practice of including a number of estimates in one table. There will often be several separate estimates in one project; but even then the simple estimate form will be perfectly convenient, the name and description of the particular work being given at the head of each estimate. Another inconvenience connected with the existing estimates in this department is that the paper prescribed for them is the large and unwieldy medium, or at least demy. This is almost rendered necessary by their form, and it is an advantage of the forms which we shall presently propose, that all estimates will be on foolscap.

The number of estimates hereafter will be diminished.

56. Under the operation of the new rules proposed above for enlarging the powers of the local officers in authorizing work, the number of estimates coming up to the Board will be very much diminished. The submission of estimates for mere repairs will be very nearly abolished. In the case of all new works, or extensions or improvements of works, it is now required and still should be, that the necessity of the work or the advantages anticipated from it should be fully stated in a separate letter, and those cases of repair which alone will hereafter be brought by estimate before the Board will also require similar explanation. Such information will render a repetition of the same particulars in the body of the estimate superfluous and unnecessary, and it should be omitted.

Estimates in the Military Department.

57. The forms of the estimates of the Military Department do not call for any particular remark. They contain all particulars required; quite as much of detail indeed as those of the Revenue Department so far as respects the work itself. The form is neat and compact, though we think it still susceptible of some improvement in this respect; which we have introduced into the forms which we now propose for general use.

In the Road Department.

The estimates of the road department are prepared with a great amount of detail, and with a degree of neatness and comprehensiveness in the form, which was to be expected from the known ingenious character of the late Captain Best who organized the department. The forms of estimate are two; one for the road itself, raising, gravelling, draining, &c. and the other for the subsidiary works, bridges, road dams, and revetments. The latter of these two differs but little from the Military Board form; with some little improvement, calculated to economize labour and space without diminishing the amount of information given.

The road estimate gives fully as much detail as the form in use under the Board of Revenue but in a more compact shape and in one requiring less labour to prepare or to examine. The great difference consists in this, that instead of giving the rate and amount for each "tauk" or separate item, those particulars are given in abstract at the foot of the detailed measurements, but in such a form as to supply precisely the same amount of information as under the other mode. This is the substantive estimate; and all the separate estimates for bridges, tunnels, road dams* revetments, &c. are given in an Appendix, having numbers corresponding with similar entries in the body of the main estimate.

All the dimensions in all the estimates of the road department, whether of length, superficial or cubical, are in yards and sixteenths.

The mode of examining estimates.

In the Military Department.

58. As introductory to what we have to say presently, we will next describe the mode in which estimates are examined and tested by the controlling authorities in each of the three branches of the department.

The estimates coming up to the Military Board are first examined in the office of the Chief Engineer. For this purpose they are sent up by the local officers, not to the Board but direct to

* The term tunnel as here used, is applied to very small bridges under a yard and a half in span; they are generally for the passage of small irrigation channels. Road dams are small depressions in the road, paved with stone, for the passage of small and shallow jungle streams very near the surface of the road in elevation. They are much less convenient than bridges, but they are also much cheaper.

the Chief Engineer. Formerly they came up first to the Board and after being circulated to the Members were referred to the Chief Engineer; but in the beginning of 1851, their previous transmission to the Board was dispensed with. The first thing done in the Chief Engineer's office is to enter the heading and amount of the estimates in the diary; the estimate itself is then copied at length into the estimate book of the office, and if there is a plan a copy of it is also made for the office. All this having been done the estimate and plan come into the hands of the estimate maker for examination; and the processes which they there undergo are as follows. In the first place the estimate is compared with the plan, if there be one; this is done by taking a pair of compasses and accurately testing the dimensions of all the parts of the plan, by the scale appended to it. If in any case any of the dimensions are found when thus tested to be smaller than those provided in the estimate, the latter is altered to agree with those dimensions. Plans are not sent up for mere repairs; in the case of such estimates therefore this part of the examination is omitted.

The next operation is to examine the rates allowed in the estimate. For this purpose the office is provided with tables of the cost of a given quantity of all the various sorts of work at the several stations of the Army; and as the officers making the estimates have similar lists, which they make use of in preparing them, there is not commonly much change made here. If in any case the rates set down in the estimates exceed the office rates, they are usually altered. This part of the examination appears to be made with much care in the Chief Engineer's office; but perhaps the office rates are too rigidly applied to all cases.

59. The third operation is to test all the calculations appearing on the estimates, which are often very numerous; this also is very carefully done. The estimate maker further carefully examines the plan and estimate and compares them together, to see whether any necessary part of the work has been omitted.

Further examination.

After this the papers are brought to the Chief Engineer who makes any remarks that he deems necessary on the design of the work; and sometimes the plan and estimate are returned for correction to the office who sent them up; at other times they are corrected in the office. Finally, after being duly corrected, they are sent to the Military Board. In the Board's office the estimates are examined with reference to points not touched in the professional examination in the Chief Engineer's office, viz. whether the accommodation provided is as much as was sanctioned by Government and no more, and whether the plans and sites have been approved by the authorities of the departments to which the building belongs. The estimates are then ready for disposal and they are disposed of without delay; if within the authority of the Board they are at once sanctioned, if beyond it they are sent up to Government for sanction, with the Board's recommendation written across them in red ink. When sanctioned the original estimate received is sent down for execution to the officer from whom it came.

60. The following is the course observed in examining estimates in the office of the Public Works Department of the Board of Revenue. In the first place the estimates are entered in a register. If there is a plan, a copy is made of it for the office use; no copy is made of the estimate as it is usual to retain the originals received from the Civil Engineer. In the case of works not of irrigation however, if a Civil Engineer requests that an estimate may be sent back to him, it is returned, a copy being taken. After this the estimate is laid on the Secretary's table together with the plan if there is one, and with the Civil Engineer's diaries and other papers and reports connected with the work proposed.

In the Revenue Department.

The Secretary compares the estimate with the plan; but this is not done with the minuteness observed in the Chief Engineer's office. It is not the practice at all to alter the estimate if it should happen not quite to agree with the plan; the latter is only used for its proper purpose, viz. as an additional help to the thorough understanding of the exact design of the work estimated for.

61. The Secretary also examines the rates allowed in the estimate. But this also is done with less minuteness than in the Chief Engineer's office. There are no data lists in the office, or lists of rates and prices, and the Secretary only examines the rates in a general way, to see that they are fair and moderate. His only means of judging is from his general knowledge of the rates in other estimates from the same locality, and perhaps some local knowledge if he have formerly been employed in that Division. It is further to be observed that whereas the work controlled by the Military Board is almost wholly confined to Military stations; that performed under the

The rates how examined.

orders of this Board lies for the most part scattered about the country, some in or near towns, but the larger part in villages remote from considerable towns, and much in wild and jungly tracts. It is obvious that the circumstances of individual works must vary much more in the latter case than in the former, and that average rates must be less applicable universally. It should be added however that the Civil Engineers who make a considerable portion of the estimates, including all of any magnitude, and almost all those for new works or improvements, and who examine and certify all those made by the tahsildars, have data lists in their offices, and have also local knowledge which enables them to check the rates with confidence. The Secretary further examines the estimate to see that no part of the proposed work is omitted.

Further processes
in the examina-
tion.

62. Sometimes an estimate is returned for correction to the Civil Engineer but more commonly, corrections required are made in the Board's office. The Secretary also investigates the merits of the project embodied in the estimate, in cases of magnitude or doubt he brings it before the Board at a meeting; but in ordinary cases he circulates for approval a draft in accordance with his own views upon it, which draft goes to all the members including the Chief Engineer. And in doing this he often makes material alterations in the plan, and consequently in the estimate changing the span of an arch for instance, or its form or scantling, or altering the dimensions of the parts of a calingulah, or their arrangement. In all cases of new works proposed, the project is sent for the special report of the Chief Engineer, who if he thinks proper records a separate opinion upon it.

In this department the last operation of all is to examine the calculations appearing on the face of the estimate which is done carefully by the estimate maker in the office. The reasons for postponing this to the last is that till the project has been decided on by the Board it is not known whether it will be accepted, or if it is what alterations will be made in details. The postponement saves the trouble of verifying calculations which may after all be put aside altogether.

If the Board disapprove of a proposal, they intimate that fact to the Collector and Civil Engineer; if they approve it, they recommend it to Government for sanction. It is the practice of this office, as a general rule to send up only estimates in the first and last quarters of the Calendar year, and only bills in the second and third quarters; but in cases which seem to them to require some promptitude this rule is disregarded as respects estimates, and those for particularly pressing works are sent up as soon as ready. On sanction being given, it is notified by the Board to the Collector and Civil Engineer.

The estimates in
the road depart-
ment how exam-
ined.

63. The estimates in the Road Department are sent up direct by the Superintendent to the Government without passing through any intermediate authority. The mode in which they are dealt with is as follows. There is no establishment of accountants or estimate makers in the Government office, and consequently the estimates are not examined at all arithmetically; neither the multiplications by which the cubical or superficial contents of each item are ascertained, nor those for obtaining the money amount, are examined; nor is even the abstract appended to the detailed estimate compared with the details, or even with the corresponding abstracts exhibited in the estimate itself. Again, the rates allowed in the estimates are not tested or checked in any way; there being indeed no means whatever in the office of doing it. In fact the estimate seems to be rarely referred to at all in the Government office; the order being passed generally on view of the explanatory letter by which it is accompanied. This letter goes in circulation to the Members of the Government together with all previous correspondence referred to in it, but the estimate is not circulated. After the papers return from circulation they are sent up, together with the estimate, to the Secretary, and the order signified by the members of Government is then put in writing. In drafting the order the Secretary sometimes wishes to refer to the estimate, and perhaps sends it down to the uncovenanted Assistant, but even then the arithmetical processes are never tested. In short no more examination seems to be made in the Government office into the estimates of the road department, than of the other two departments. The estimates are received on the sole guarantee of the Superintendent himself, who is regarded, though we decidedly think erroneously, as occupying the same position of control as is held in the other departments by the Revenue and Military Boards.

Remarks on the
several processes
of the examina-
tion.

64. Thus we see that the examination given to the estimates in the whole of the department may be resolved into the four following processes.

1st.—Testing the estimate by the plan and correcting it where it differs from that;

2nd.—Recalculating all the numerous items appearing in it;

3rd.—Scrutinizing the rates;

4th.—Ascertaining that the estimate is complete, i. e. that it provides for all that is required.

These four operations comprise all the examination given to the estimates as estimates; the consideration of the merits of the project which the estimate is designed to carry into execution, is a different thing altogether.

Of the above four processes the first is confined to the Chief Engineer's office alone. In the office of the Board of Revenue the plan is used for its legitimate purpose of explaining and elucidating the exact design of the Engineer; but it is only in the Chief Engineer's office, that it is made the standard to which the estimate must be made to conform. And this use of it is clearly wrong, and tends to frustrate the intentions of the Engineer; for it is by the estimate, and not by the plan, that the dimensions of the work will be regulated in the execution.

The first process;
comparison with
the plan.

65. The second process, viz. that of recalculating all the numerous calculations appearing in the estimate, is performed in the two offices just mentioned with equal care. We cannot but consider it equally useless and unnecessary labour in both. An estimate is simply a statement of the probable cost of a given work; it is made beforehand on an average of a great variety of circumstances, and it can never pretend to be more than an approximation to the actual fact. It serves the important purpose of informing the Government of the probable outlay required for a given work; and it would do so sufficiently well for all the legitimate purposes of an estimate, even though it should not be nearer the actual cost of a work than 5 per cent. Now it appears from a return which we have obtained from the Chief Engineer, that in the official year 1850-51 eight hundred and seventy estimates sent up to the Military Board were examined in his office. Their aggregate amount was 7,43,825 Rupees and the total reduction in their amount on his examination was no more than 3,003 Rupees or less than one half per cent; and a part of this (though we have not the means of accurately stating the amount) was the result of that examination of the plan which we have described, and was therefore not a fair reduction. Probably the errors of calculation detected did not amount to one fourth of a unit per cent.

The second pro-
cess; re-calcula-
ting the items

66. Under the Board of Revenue the error discovered is still more trifling. The whole amount of the ordinary irrigation estimates throughout the Presidency for the year 1849, was Rupees 4,86,346, comprising many thousand separate arithmetical operations. The whole of these were laboriously tested in the office of the Board of Revenue; and only a single error was detected, to the amount of two rupees. We have examined a number of other estimates taken at random, which had passed through the Board's office, many of them to a large amount and comprising a great number of calculations; and in all we found that the amount of error discovered was either nothing at all, or quite insignificant. Among those exhibiting the largest corrections was an estimate sent up by Captain Horsley Civil Engineer 8th Division, for a road to connect the cotton tracts in Tianvelly with the Port of Tuticorin. The amount of that estimate was 1,75,559 Rupees; and it contained considerably more than four thousand sums in multiplication besides several hundreds in addition and division. The whole of these very numerous arithmetical processes were repeated in the office of the Board of Revenue at a great expense of time and labour, and the total amount of error of calculation of all kinds found in the estimate was 1,022 Rupees, or a little more than one half per cent. Now an amount of error as great as a half, or one, or even five per cent, is utterly and literally immaterial in a document which only professes to be an approximation, and which never can be any thing else. Any more serious error, as the omission of any part of the building or other work through oversight, would still attract notice just as surely as it does now.

Only very little
trifling error in
calculation is
discovered.

67. On the foregoing consideration we are decidedly of opinion that the practice of recalculating estimates in the office of the controlling Board should be discontinued; the responsibility for the calculations being left with the officer making the estimate. And we feel no doubt that small as the amount of error is now, it will be smaller under such a system; that when an officer feels that he has no after examination to trust to for the detection of mistakes, the calculations will be even more carefully made than at present. It must be remembered that an executive officer, such at least as they would be under our proposed new system, has skill, knowledge, and experience, as well as a character to maintain and a livelihood at stake. The Government have a right to avail themselves of these qualifications and guarantees, and to trust those officers in the

The practice is
useless, and
should be dis-
continued.

performance of the duties committed to them, without subjecting their operations to minute scrutiny on trifling points." And we cannot but think that such liberal treatment is the most likely to render honourable men active and zealous for the interests of the Public Service.

The third process;
testing the rates.

68. The testing of the rates allowed for work in the estimate is undoubtedly useful, and indeed necessary, as the rates from one of the very essential elements on which the estimate rests, and a seemingly trifling variation there may largely affect the total amount. In the Chief Engineer's office this examination is made with much minuteness, the estimate rates being rigidly compared with the current rates of the station as recorded in the office, and these rates are corrected by fresh reports every six months. In the Revenue Department on the other hand there is no such exact information, and the only test is the general knowledge of the Board's professional Secretary. Even this check, vague as it is, has a value; and perhaps in practice, and considering the nature and position of the work in this department, it is fully as efficient and tends fully as much to truth, as the more exact examination in the Military Department.

The proper use of
this process.

69. But it is absolutely essential when the rates are tested by either method, and especially in the Revenue Department where works vary so much in situation and circumstances, that the real nature of an estimate should be borne in mind. It cannot be too often repeated, because the opposite error is so general and so fondly cherished, that an estimate is and must be an approximation only. It is based on averages, and the actual facts in the Revenue Department particularly, vary widely; resting thus on averages, it cannot be any thing but an average itself; and the very term implies that actual cases must generally vary on one side or on the other. The actual cost of work cannot then be expected to agree with the estimate generally, but only occasionally; and if the estimate is made the standard with which to compare the bill, the almost certain result will follow, especially with an executive unscrupulous, and very little under efficient control, that the bills will be modified to suit the estimates; the saving on one work being used to cover an excess on another. We shall have to show in our Third Section that this has been largely the case in the Revenue Department. An estimate should be regarded merely as a probable measure of the cost of a work, which ought not to exceed it or fall short of it by more than a certain moderate per centage. Thus regarded an estimate is most useful; but if made the standard by which to try the bill, it is mischievous.

The Fourth and only remaining process, viz. ascertaining that the estimate provides for every part of the work, is proper and must be continued.

The proper mode
of examining
estimates.
By the inspecting
Engineers.

70. Having thus detailed the present method of examining the estimates, and considered the value of each process, we will now briefly state what we think the examination ought to be.

Under the executive arrangements which will be proposed in the Third Section, estimates in the districts will be made by the Department of the District Engineer and in the Military Stations by the Executive Engineer. They will come to the Presidency authorities through the Inspecting Engineer of the Division, who will have in his office continually accumulating data lists of the cost of the various kinds of work, obtained from the actual cost of similar work in the same or similar localities. In addition to this information the Inspecting Engineer will have local knowledge of the condition and circumstances of all parts of his division such as a Presidency authority can never possess. He will thus be in a position to exercise a really intelligent control over the rates allowed in the estimate; so as to ensure their being as nearly accurate as estimate rates can be. The Inspecting Engineer will also exercise his judgment as to the propriety of the project put before him, and will further examine into the completeness of the estimate; but he should not be expected to verify the calculations. This done, he will send up to the Board of Public Works such estimates as require the sanction of superior authority.

By the Board.

71. The Board will give their attention chiefly to the two points last mentioned, though they also will examine the rates with reference to data lists which ought to be recorded in their office also. By this means they will be able to notice instances of material difference in the cost of the same kind of work in different districts or divisions and to ascertain the cause. For the reasons above given we are of opinion that the Board also ought not to be required to examine the correctness of the calculations shown in the estimate.

An efficient executive
is essential.

Lastly, it must ever be remembered that no amount of care in a controlling office can ever make up for the defects of an incapable executive. In point of fact the executive must be trusted

to a great extent; this necessity cannot possibly be avoided. It is the first essential therefore to have an able and honest agency there, next to that, an efficient controlling department is very valuable; but this can never supply the place of the former.

72. We will next consider the degree of detail with which an estimate ought to be prepared, and ought to be submitted to the controlling authorities. As respects the former indeed viz. the degree of detail in preparing estimates, it is difficult to lay down any exact rule; at present there is much variation in this particular, and that apparently without any regulation. Two instances will illustrate this diversity of practice. One is the estimate above referred to as made by Captain Horsley for a road in Tinnevely. The total length of the road to be made, including branches, is 68 miles, and there are fifty one bridges, forty seven tunnels or small bridges, and one hundred and twenty eight road dams or pavements for the passage of shallow streams over the road; there are also seventeen Chutthams for the convenience of travellers. The whole estimated cost was 1,75,559 Rupees. The Estimate occupies twenty sheets of the large paper called medium which is equal to forty sheets of foolscap, and contains upwards of two thousand separate items.

In contrast to this estimate is one from Colonel A. Cotton, Civil Engineer of the 1st Division, for a series of channels of irrigation and navigation in connection with the Godavery Anicut. These channels thirteen in number, have an aggregate length of 163 miles; and the estimate provides for four navigation locks, fifteen bridges, five aqueducts some of large size, eight calingalabs or outlets for the discharge of surplus water, and 1,089 sluices of various sizes, for letting out the water to the fields. The total cost is 1,76,357 Rupees and the estimate occupies only two and half sheets of foolscap paper being only one-fifteenth of the size of Captain Horsley's estimate. The channels themselves are given each in a single entry thus:

yds.	yds.	yds.	cub. yds.	Pice	Rups.	A. P.
Channel from Takee to Injeram. 28,000 × 5 × 2 = 280,000 at 7 = 10,208-5-4						

73. Captain Horsley's estimate certainly gives much more detail than could ever be either necessary or useful; it divides the distance into extremely minute lengths according to every trifling variation in the surface. And we say that this degree of exactness is unnecessary and useless, because practically it does not answer either of the two uses of an estimate better than a somewhat more general estimate would do. All the measurements in an estimate for road or channel or tank work, must of necessity in the very nature of things be averages only; and if these averages are taken on somewhat longer distances than Captain Horsley's (three or four times as long,) the total amount will probably come quite as near to the actual charge, and so afford Government quite as good an idea of the expenditure required, as his exceedingly detailed estimate. And the officer charged with the execution of the work would find such more general estimate fully as easy to carry into effect. For all the dimensions in estimates for such work as we are now speaking of being averages, it is obvious that the executive officer cannot work blindly by the estimates; for if he did, his work would have little more uniform surface or form than the base on which the material is laid; he is therefore compelled to resort to actual observation as a guide, and within certain limits, a little or less amount of variation does not effect the ease of performing that operation.

But if Captain Horsley's estimate was too minute, Colonel Cotton's on the other hand was much too vague for general adoption, and under ordinary circumstances it would probably have been refused by the Board of Revenue. But the work was urgent, the Civil Engineer had no officers to examine the country accurately, while that was known to be of very uniform surface and soil.

74. We will not enter farther into the question what amount of detail is necessary and proper; but will quote one instance to illustrate our meaning. In Appendix E is a specimen estimate for road work in the form which we propose for adoption: it is prepared from an actual estimate made by the late Superintendent of Roads. In the original estimates for the bridges on this road, the brickwork in the foundation was given at Rs. 2-8 a cubic yard, that above the foundation at Rs. 2-10, and the archwork at Rs. 2-14. It appears to us that this minute division is unnecessary and useless; and that if the whole three subdivisions were averaged at a general rate, the result would

In what detail estimates
ought to be prepared.

Some estimates
are much more
detailed than
others.

In some bridge estimates
useless
minuteness
of
detail is given.

for all practical purposes afford quite as accurate a view of the probable cost of the work. In order to test this we took the whole of the bridge estimates of that project, and compared the estimated amount for brickwork as there shown, with what it would be if calculated at the average

No. of the bridge.	Quantity of masonry in cubic yards.	Cost at the de-tailed rates in the original estimate.	Cost at the average rate of Rs. 2-10-0.	Per centage of difference.
1	189	Rs. 491	Rs. 496	1
2	204	525	535	1 1/2
25	223	586	585	
35	424	1,119	1,113	
38	244	638	640	
44	1114	2,946	2,924	
Total.	2,398	6,305	6,293	1 1/2

The apparent exactness is deceptive.

rate of Rs. 2-10 the cubic yard. This comparison is given in the margin, and it will be seen that the variation on the whole is only 12 Rupees on a total of 6,305, or no more than three sixteenths per cent. The extreme variation is only ten Rupees on a small estimate of 525 Rupees being 1 1/2 per cent, which is quite insignificant in an estimate.

75. But we would point out further that this great apparent exactness in distinguishing minute variations is in fact deceptive; because in reality such accuracy is not found. Thus it will be seen that the estimated cost of brickwork is given as precisely the same in the case of bridges and tunnels of all dimensions; and yet it is clear that in point of fact the cost would vary greatly in the several cases. Take for example bridge No. 44 of three arches of 36 feet span, bridge No. 2, of one arch

of 12 feet, and tunnel No. 3 of one yard broad. In the last two cases the whole of the work lies close to the material; while in the first all the bricks and chunam for the piers and their foundations have to be carried a considerable distance across the sandy bed of the river, and those for the arches along the top of the work. This circumstance must certainly increase the cost of the masonry in the larger structure; and in strictness therefore the same rates are not applicable to all; yet in these estimates the same are allowed in all. In this and in many similar cases, it is usual and convenient and even necessary, to take general average rates, because the actual cost in each individual case could not be accurately computed beforehand; nor is it necessary that it should, if the estimate is merely looked on as what it truly is, viz. as only an approximation to the real cost.

The centring.

76. Again to take the centring of the bridges in the same estimate; this charge is based on no certain data, but is a sum taken in great measure arbitrarily; here again, accuracy is not even pretended to. We object then to the great pretension to exactness in the single particular of thus minutely dividing the cost of the brickwork, because while it is quite useless for all practical purposes, it requires a great deal of time and labour; and because it tends to deceive, by inducing the belief that the estimate is really exact, and based on exact data in every particular, while in reality it is not so and never can be. We would therefore discontinue this minute sub-division; only in very large works, or in very small ones when standing alone and not forming a part of a large project, it might be proper to retain it.

The plastering.

Another abridgment of the estimates would be effected by including the estimate for plastering in that for brickwork. In order to the doing this with perfect exactness, it would be necessary that the superficial area of the structure above the ground should bear an unvarying proportion to its whole cubical contents. But though from various causes this relation must continually vary, yet on the whole the amount of the variation is not likely to be very great. A reference to Appendix E, 2, will show how large an amount of labour would be saved in calculation if this plan were followed. We do not propose this course now; but probably it will be adopted hereafter.

The minute detail of estimates need not be sent up to the Board.

77. Every estimate should be drawn up with so much detail as is necessary to fit it to serve the two purposes of an estimate just stated, viz: 1st, to convey a just idea within narrow limits, of the probable cost of the proposed undertaking; and 2nd, to guide the executive officer in performing the work. But it does not by any means follow that the whole of this detail ought to be laid before the sanctioning authorities. A certain measure of minute detail in preparing the estimate is necessary in order to enable the officer to produce correct results; the more skilful the officer, the less minute need he make his preliminary measurements; but a certain amount may be said to be necessary to all, in order to produce correct results. But it is with results, and not with the minute measurements from which they were deduced, that the controlling authorities have to deal. And further, those authorities have no possible means of testing the measurements. A road

estimate for instance is made up of a multitude of items of varying dimensions; in some, the earth work is a yard high, in others 1/2 yard, in others 1/4 yard, and so on of other things. The Presidency Board cannot possibly tell whether these heights are properly given, nor is it at all necessary that they should be able to do so; their concern is with the total amount produced. The details are necessary to the officer making the estimate to enable him to obtain that total, but they are not necessary to the Board, and could not be of any use to them in judging of the estimate.

78. We have before us two instances which we may cite as examples to show not merely the inutility, but the positive inconvenience, of the present system of sending up the whole detail of such documents. The first is an occasional estimate for the repair of an irrigation channel in Tinnevely district. The work in view was the clearing of the channel from the deposits of mud and the obstructions of rock which impeded the passage of water along it. The estimate is made with much care and minuteness; and such exactness is of much use when the work is to be executed by ignorant and careless maistries. But we object to the waste of time involved in the submission of such detail to the controlling Board. This estimate, simple as is the nature of the work, and though only for the small amount of 5,228 Rupees, occupies two sheets of demy paper very closely written; and contains 162 items, and 329 separate sums in multiplication, besides some in addition. The transmission of the detail to the Board involved the making of a copy of it by the very scanty and hard worked establishment of the Civil Engineer which would certainly be much more than a day's work for one man, and further the recalculation in the Board's office of 314 multiplication sums, besides the addition of 157 items together, and this would probably occupy one man in the Board's office fully two or three days; and yet this arithmetical examination in the Board's office, for which alone the detailed estimate is needed, is utterly useless. For all the purposes of the Board or of Government the short abstract of five lines appended to the detailed estimate would have been abundantly sufficient; and even that conveys more information than the Board at present (in the absence of good data tables) have the means of using.

An example of the inutility of sending up such detail.

79. The same project furnishes also an example of the clumsiness and uselessness of the long form of "occasional" estimate for irrigation works spoken of above in para 53. Column 16 of the estimate first spoken of states the usual revenue derived from the channel at 1,31,652 Rupees and the expected increase at nothing, signifying that the proposed work was designed rather to maintain and secure the existing revenue than to effect an increase. And the explanatory letter which accompanied the estimates stated at length the reasons for recommending the work, viz. it was to increase the cultivation of second crop, and to save the heavy yearly remissions, amounting in one year to 30,000 Rupees, consequent on a deficient supply of water under the existing bad condition of the channel. This information however did not satisfy the Board, who called for a statement in the long form, to show the revenue aspect of the work; this was furnished accordingly, but it did not add one iota to the information already before the Board. We do not however object to the form on the ground that it gives no useful information, for it may often do so; but on the ground that such information ought to be given apart from the estimate for the work, and in a much more convenient shape. For the single line of information in this instance, information too which was already before the Board, a sheet and a half of large and heavy demy paper was required.

Showing also the uselessness of the "long form" of occasional estimate.

80. This case in which there is nothing exceptional shows how the existing formal restrictions impede improvement. The estimate was first included in the list of "Ordinary" estimates; and it appears properly to belong to that class, for the amount far from exceeding the revenue from the work was only 4 per cent on it; and the work to be done was little more than simply clearing out accumulations of deposit. A small sum of 3,206 Rupees had indeed been similarly expended on another part of the channel in the previous year on ordinary estimate and with marked benefit; but that did not make this less a mere "ordinary" repair. Yet, on the ground that the object of the work was not merely the maintenance, but the "contingent improvement," of the revenue, the Board required that the estimate should be sent in full detail, with a report from the Collector; and this having been done, and all the incidents of the work and its anticipated effects on the revenue having been stated, the further formality of the "long form" of estimate was called for. These two calls occasioned much waste of valuable time in the office of both the Collector and the Civil Engineer; that they did not delay the work for a year, and so cause the loss of a year's improved revenue, is owing only to the active eagerness of both officers to obviate that delay; a

And the effect of the present forms in impeding improvement.

contingency which cannot be looked for every such case. It is this sort of official formality, impeding improvement without any counterbalancing advantage, which we are so anxious to see annihilated.

Another instance.

81. The work just remarked on was one which being of small amount compared with the revenue from the channel concerned, and being merely for the clearing of the channel, will not under the new rules proposed above, require the sanction of superior authority, but will be at once undertaken on the authority of the Collector; the other example is taken from a new work of some magnitude, such as will always be reserved for the sanction of Government only. The project was for an Anicut on the Cheyaur river in North Arcot district, with a channel from it to supply with water a number of tanks spread over two talooks. The channel was to be 27,775 yards in length, and to cost 15,286 Rupees. The estimate for it extends to 153 items and involves 467 sums in multiplication. The other estimates, viz. for the anicut, for the head sluice of the main channel, for the surplus calingalahs, the irrigation sluices, and other subsidiary works, are 27 in number, and contain 412 sums in multiplication, beside a large number in addition. The whole estimates occupy twelve sheets of demy paper and contain 879 sums in multiplication. These estimates at full length, and accompanied by plans of the channel and of all the works, were submitted to the Board of Revenue. They were there examined at length, the whole of the numerous arithmetical processes being repeated, at the cost of many day's labour, with the result of discovering an aggregate error both from mistakes in calculation and clerical errors combined, to the amount of Rs. 30-2-0 or something under one-tenth per cent.

Further particulars.

82. This having been accomplished, and the Board being satisfied of the expediency of the work, the whole of the papers, the reports of the Collector and Civil Engineer, the bulky estimates, and all the plans, were sent up to the Government. The proposal obtained approval in the Council chamber, as it had with the Board of Revenue, though it may safely be asserted that the details of the estimates were never glanced at there, and it is very probable that the estimates themselves were not even opened, or any of the plans consulted, except perhaps that of the anicut itself. But the amount of the estimates was larger than the local Government have power to sanction, and it was necessary to apply for the sanction of the Government in India. The whole of the papers were again packed up, therefore, and despatched to Calcutta, with a strong recommendation in favor of the project from the Government of Madras. There is no doubt that the details of the plan were not looked at in Calcutta, for the mere amount of the demand frightened the authorities there, and though the annual increase of Revenue promised by the work was 10,000 Rupees, or 33 per cent on the outlay, the reply received was that in the existing state of the finances of India the undertaking had better be postponed. The Madras Government however were so convinced of the soundness of the project, that they again urged it on the authorities in Bengal; and at last the consent of that Government to the expenditure was obtained.

The amount of detail proper to be sent up to the Board.

83. We have given these instances to show how useless and absurd is the present plan of sending up all the details of estimates to the controlling authorities. The estimates are not, in general, too minute as estimates, but what we contend against is the practice of submitting all this detail to authorities most of whom never even look at it, while the only one that does so expend on it a great deal of labour which so employed is absolutely thrown away. The following is our view of the form in which estimates ought to come up to the controlling Board. First as to works of irrigation; we think that of the earthwork an abstract only should be sent, showing the different rates of charge allowed, and the reasons. With respect to works of masonry, such as anicuts, bridges, head sluices, calingalahs, under sluices, irrigation sluices, &c. it is necessary that the Board should have before them all the particulars necessary to inform them fully as to the proposed form and dimensions of every such work, to enable them to exercise a salutary professional check over them. For this purpose we propose that the estimate for each such work should be sent up in abstract, omitting minutiae, but stating the total quantity of masonry &c. in each division of the structure, as well as the rate allowed. This amount of information aided by the plan, will be abundantly sufficient to enable the Board to exercise an efficient control. The points to which that will be directed will be the suitability of the work proposed, as to form, materials, and scantling, to the object in view, and the rates on which the estimate is framed.

In the case of roads.

84. In the case of roads also, the detailed estimate need not and ought not to be sent up to the controlling Board. All that the Board requires, and all that it has the means of turning to

any beneficial use, is an abstract similar to that of which we have already spoken of in the case of works of irrigation. Such an estimate will show the total cost of the earthwork and of the metalling, and the rate for each cubic yard, the number of bridges, tunnels, and road dams, and the size, rate of charge, and total cost of each; as well as the rate and cost of the other extra or miscellaneous sorts of works; there will also be abstract estimates of all bridges and drains, and plans of all bridges of above two yards span. A greater degree of detail than this would be no advantage to the controlling authorities, because they could make no use of it. It could not be of any service to them to know the number of cubic yards of material to be laid on every yard or furlong of length. That is one of the particulars going to produce the general result in view, viz. a road of certain breadth and substance; but it depends on the undulations of the ground and the nature of the surface, and to judge of it requires an accurate local knowledge which no distant authority can possess.

Further, in all cases except where the project shall have been already approved by the Government, a letter of explanation will accompany the estimates. That letter will show the reasons existing for constructing or improving the road. It will also show the general line taken, the nature of the country in a general view, the main difficulties, whether of the nature of mountain passes, swamps, rivers, &c. the width of road proposed, the width and thickness of metalling to be allowed, the nature of the material available, the facility or difficulty of procuring it, and the principal streams to be bridged.

85. The information laid before Government by the Board in sending up a project for sanction, might be still more limited. All that Government need to be certified of is the fitness of the object in view, the suitability of the means proposed, and the probable cost. On all these points they will have full information in the explanatory letter from the local officer, and that confirmed by the opinion of the Board. A knowledge of the details of the works proposed is not necessary to enable them to give a judgment on any one of those points, nor is the Government from its very constitution competent to deal with such details or to form an independent opinion upon them. The submission of those letters only, therefore, would suffice to give the Government all the information necessary: but as the mere transmission of the plans and short estimates by the Board will not involve much additional trouble, copies not required for the purpose, it may be expedient to send up to Government all the papers which the Board themselves receive.

What information to be laid before Government.

86. We have deemed it expedient to give in the appendix forms of estimates for each of the three main divisions of works in the Department, viz: Works of Irrigation, Roads, and Buildings. They are drawn up in accordance with the views above expressed, viz: for each work a detailed estimate similar in the main, though not entirely, to those now generally in use, and an abstract estimate omitting the detailed measurements of the work, and giving only those particulars which are required to enable the controlling authorities to judge of the soundness of the estimate. In order to make the forms more intelligible, we have filled them up with the details of actual estimates which have already come before the authorities. They are in fact the same estimates arranged in new forms. With a single exception in the case of road, the detailed or "working" estimates contain precisely the same amount of detail as the original estimates from which they were prepared; and those for the tank and the building are not greatly altered in arrangement; the road estimate is rather more changed. We will conclude this Section with a few explanatory remarks on the new forms, which will be found in Appendices D, E and F.

Forms of estimates are given in the appendix.

87. Appendix D 1 is an estimate for the restoration of an ancient tank which was destroyed by a storm above half a century ago. It is given as a specimen of the proposed form of estimate for works of irrigation. It comes under the class "new works," and is in the "Revenue Department;" these particulars are noted at the top of the paper. The heading also clearly specifies the work; and the several principal facts are so arranged there as to catch the eye at once, and so save time. The same remark applies to the headings of all the forms.

Remarks on the forms; the "Board estimate" for irrigation works.

This estimate shows the total quantity of work of each kind in every part of the project; together with the rate at which it is expected to be executed, and the cost at that rate. It does not give the detailed measurements, which are in the detailed working estimate, Appendix D 2. The earthwork comes first. There are two sorts of work at two different rates; therefore there are two items. Next comes the stone revetment; in this there are three rates, and

therefore three items. Lastly is the calingalah, in which the same rule is adhered to; and throughout these estimates the same is followed, viz. that every variation of rates shall be shown. The abstract estimate thus comprises all the information necessary to enable the controlling Board or the Government to form an opinion on the project, and the proposed means of carrying it into execution. And aided by the plan, which now does and always should accompany every estimate except those for mere repairs, it will serve to convey a complete idea of the design of the work in every particular.

The detailed estimate for the same.

88. Next comes, in Appendix D 2, the detailed working estimate for the same tank. The heading corresponds with that of the estimate last remarked on. The document gives all the detailed measurements as taken by the officer who made the estimate, and all the dimensions of every part of all the works. Its arrangement is the same as that of the abstract estimate; first is the earthwork, then the revetment, and lastly the calingalah. The work to which this estimate refers being simple and of small amount, the separate estimates are few. We had prepared in our new forms the numerous estimates belonging to the Cheyaur anicut and channels; but we found they would occupy more room than we thought could properly be given to them; and we therefore took this smaller work instead. We should add however that in large and complicated projects; such for example as that on the Cheyaur just spoken of, comprehending many distinct works, or calingalahs, irrigating sluices, under sluices, aqueducts, and bridges, the same arrangement should be adopted as in the road estimate which follows this: viz. that in each case the main estimate should contain only the earthwork and revetments, and the estimates for all the subordinate masonry works should follow in succession. Further, when there are many rates in the earthwork, or rough stone, it will be well to give an abstract of the earthwork &c. similar to that attached to the same detailed road estimate.

At the end of the detailed measurements follows an abstract; which shows the total of each sort of work in each separate estimate, with the rates and cost. This abstract is in fact a counterpart of the brief estimate submitted to the Board. The estimate is thus complete as a guide to the executive officer. It is even uncertain whether he needs to be informed of the prices allowed; the late Superintendent of Roads was in the habit of giving his maistries blank estimates, containing full particulars of measurements but no rates or prices, the maistries being left to do the work as cheaply as they could.

The "Board estimate" for roads.

89. Next is the specimen estimate for roads. E 1 is the brief form for submission to the Board, and E 2 is the corresponding detailed or working estimate. Both are taken from the actual estimate made by the late Superintendent of the Road Department for a new road from Coimbatore to Walliar. The general form in these estimates is the same as in those for irrigation works just remarked on. The earthwork comes first, then the metalling, then the rough stone work, then the clearing jungle and mile stones, and lastly the bridges in succession.

In the earthwork there is only a single rate of charge, and the whole therefore is given as one item; in the metalling there are two rates and therefore two items; and so on throughout the whole; the quantity, rate, and total cost of each item being shown, but not the detailed measurements. We should observe that in the original estimate the foundation, masonry above foundation, and archwork, are all estimated at different rates, for each bridge, but with reference to what we have said above in para 74, we have averaged all three at a single rate, the result of which is a total estimated cost almost exactly coinciding with the total of the three items in the original estimate.

In the original document an estimate of the "Superintendence" required for the work follows last of all. This we omit: because we are of opinion as will be stated hereafter in the proper place, that the system in the road department of charging the cost of the executive agency to particular works is bad.

The detailed estimate for the same.

90. Appendix E 2 is the detailed or working estimate for the same road as the foregoing. In this we have preserved the general form of estimate adopted by Captain Best, which in our opinion is better than that in use in the Maramut Department; but we have made a few changes with the view of obtaining increased clearness and conciseness. We have retained Captain Best's practice of adding up and showing separately the total amount of work in each mile; because it has its uses, though we are not sure that they are worth the additional trouble involved. We have also made no change in the minute division of the distance, though we think that in taking measurements for the estimate, the separate "tasks" or items might have been advantageously lengthened,

and so diminished in number. We have also allowed the columns showing the distance from Madras to remain; though we are of opinion that the only use of this in an estimate viz. that of enabling the executive officer to ascertain any particular locality therein provided for, might be attained by simpler means.

The general construction of the estimate is as follows. There is first the main estimate showing in full detail of minute measurements the quantities of earthwork or embankment, metalling, turfing, rough stone work, &c. Then follows an abstract of the quantity of work of each of these descriptions, with the rate allowed and the cost; the detailed estimates for all the bridges, road dams, and other works of masonry follow in succession, each with its proper number attached.

After all these estimates, which give the detailed measurements of all parts of each work, there follows, as in the tank estimate described above, an abstract showing the total quantities in each work or part of a work, with the rate per cubic yard, and the cost at that rate. This as before is a transcript of the "Board's estimate." But in addition, for convenience of reference, the estimate for each bridge and tunnel is indicated by a number, and a similar number is attached to the same work in the detailed list.

91. Appendices F 1 and 2 are the abstract and detailed specimen estimates for a building. The work chosen is a dispensary recently erected at Chiringleput: the original estimate was framed by the Civil Engineer of the 4th Division. The forms now given are intended to serve for buildings of all kinds in all departments. Appendix F 1 is the abstract or Board's estimate; the estimate for the main building comes first, and is followed in succession by those for the detached buildings. As in the instances already remarked on, the abstract or Board's estimate gives only the total quantities, with the rates and prices; the plan, which does and always should accompany all estimates for new buildings or for improvements or alterations, will explain in a clear manner the dimensions of every part. The detailed estimate (Appendix F 2) gives as in the two former cases the measurements of all the various parts of the work, and the calculations of which the totals in the Board estimate are the result. The first part of it does not contain those portions of the buildings which are not based on detailed measurements, such as pillars, doors, windows, &c. These are given in the abstract which follows. The details of the various detached buildings follow in the same order as in the Board's estimate.

The estimates for buildings.

92. In conclusion we will make a few general remarks on some points in these forms. Throughout the forms of estimates for irrigation works and roads, we have used the yard divided into annas or sixteenths, for all dimensions. This is the practice in the road department already. In the Revenue Department the yard is used for earth work and rough stone, and the foot for masonry; yet even there, though all the measurements are taken in feet, yet in the totals the cubic feet are reduced to cubic yards and the cost is so calculated, all the data being for the cubic yard. The yard divided into sixteenths appears to us to have advantages; the fractional parts are easily calculated; the unit is one sixteenth, or 2½ inches, being the thickness of a standard brick; and an eighth is the width, and one fourth is the length of such a brick. In the building estimate we have allowed the measurements in feet to stand. One reason for this was that the existing data for roofing, plastering, flooring, and other superficial work, is by the square of one hundred square feet; which could not be stated in square yards without a fraction; in the military department too all building data are in terms of feet. We also wished to show both modes. It is a matter of no very great importance whether the foot or the yard is made use of; but the latter seems to us preferable, as involving smaller numbers and easier calculations.

General remarks on some points in the proposed forms.

The measures used.

93. In the headings of the estimates care has been taken to make the principal points prominent; this though seemingly a trifling matter is important in saving time where many such papers have to be constantly referred to. The headings of the bills will correspond, i. e. will show the same particulars. The department to which the work belongs, and its nature whether a new work, (including improvements and enlargements) or repair, are shown, in order to aid the office of account in charging the expenditure to the proper head.

The headings.

We propose that the estimates should be numbered for easy reference; but the name and locality of the work, whatever its kind, are given also in full. In the road department the estimates are distinguished by letters only, and the roads by numbers only; without names in either case. This plan, though it may save time to persons long habituated to it, is certainly puzzling and confusing to all others; we think the practice is objectionable, and ought to be put an end to.

The estimates to be numbered.

Fractions
omitted.

We have only to add that we have omitted the fractional parts in all the totals both of dimensions and of money. In the rates the smallest fraction is of value, and should be retained; but such exactness is useless in the totals, and the omission saves time and labour. Where the fraction is a half or more than half, one is added to the integral number; where it is less than half, it is omitted entirely. The difference in the total can never exceed a very few rupees on one side or the other; and that is utterly insignificant in an estimate, which is and ever must be no more than an approximation to the actual cost.

The Railway
forms of esti-
mate.

94. While the later sheets of the foregoing section were in the Press, we had an opportunity of inspecting the estimates for a portion of the Madras Railway, and of conversing on the subject with Mr. Bruce the Chief Engineer of the Line. These estimates are made according to the practice followed on railways in England. We find that in their general arrangement they agree exactly with that which we have been led to advocate. That is, in every case the measurements are taken, and the contents of every part of a work are calculated, with minute care; but the estimate does not exhibit these details, but only the general results, in the total quantity of each sort of work in the bridge, embankment, or building in question, the rate, and the price at that rate. It is the latter document alone which is sent up to the controlling and sanctioning authorities, the detailed measurements remain with the Engineer who took them or who framed the estimate from them.

Mr. Bruce's estimates are very complete, neat, and concise; and with his permission we print them in Appendix G, thinking it likely that they may afford some useful hints to the officers of our Public Works department. For we must observe that though we have given forms of estimates, we give them only as improvements on those now in use; and we are far from thinking that they themselves cannot be improved upon. The railway is portioned out in "Divisions" of 25 miles, each under a "Resident Engineer," and these divisions are further subdivided into two "Sections" of 12½ miles each, under "Inspectors." The estimate in question is that for the first section of the first division of this line; it includes the whole cost except that of the materials of the permanent way, viz: the rails, chains, sleepers, and minor articles.

The "estimate" of
the works.

95. Appendix G 1 is the "estimate" for the works. It will be seen that the several divisions of it occur in an order almost the reverse of that which has been usually current in our departments, and which we have adhered to; viz: the bridges and other masonry works come first, and the earthwork of the embankment almost the last; the order of the parts however is a matter of mere arbitrary choice. It will be seen that the estimates for all the bridges, (except one which is of rather large size,) contain two items only, viz: "excavation" and "brickwork;" the total quantity, and the cost of each being given. With reference to a remark above respecting the mode of estimating for plastering, we may observe that these estimates do not provide for plaster; as it is Mr. Bruce's intention that where bridges are built with bricks made and burnt under the direction of the Railway officers, no plastering shall be used. He expressed the opinion that where it is used the estimate for it may properly be included in that for the brickwork. Sundries or contingencies are allowed for in the lump, in the summary of the whole of the estimates. The heading of the estimate for each bridge defines its exact position on the line. It will be observed also that these estimates agree with those proposed by us in omitting the fractions from the quantities, adding one in place of the fraction. In the case of sums of money, the fractions are retained; we think needlessly.

The estimates for the approaches and for metalling them, give the exact quantities in each case, and those for the earthwork in excavation and embankments give the quantities in each mile. The reason of this may be that this estimate with the plan and specification forms the only guide to the Executive Engineer or the Contractor; the detailed measurements remain with the Engineer who took them or who framed the estimate from them. Those particulars seem clearly not to be required for the information of the Board of Public Works or of Government.

The detailed mea-
surements.

96. G 2 contains the detailed measurements of all the masonry and some other works. It needs no lengthened remark. The measurements are taken with much care and minuteness. Like the corresponding documents given among our proposed forms, those for masonry give quantities only, without the rates, which are affixed in the "estimate." As respects crossings

gates, &c. both the measurements and the positions are stated with exactness. The data on which the cost of fencing &c. is calculated, are also given.

G 3 is a very useful paper, but such as is not now in use in the Public Works Department of this Presidency; a list somewhat similar was formerly required to accompany the estimates in the Military department but it has been discontinued. It gives the quantities of bricks and chunam required for each masonry work included in the estimate, as well as the quantities wanted in each mile of the line. A memorandum of quantities must almost necessarily be made for every work before the materials for it can be provided; but it has hitherto been left to be made by the maistries for themselves. Such a Memo. is further useful in the hands of the Executive officer or Overseer in charge of a line of road or of a number of works, as it tells him at a glance how much material of each kind is required for the whole of the bridge or other work that he may be inspecting while under execution, and to check the quantity alleged to have been used. It is easily made out from the estimate by means of simple formulæ, provided only the dimensions of the bricks and of the measure used for chunam are ascertained and uniform; and it might be useful to require that it should always be prepared at the same time with an estimate. It is not at all necessary, however, that this list should be sent up to the controlling office; it should only be placed together with the estimate, in the hands of the overseer or maistry charged to execute the work.

G 4 contains the measurements for the cutting and embankment; it is made with much exactness and care, more perhaps than would be necessary in the case of a common road or a channel. We give only a portion of it as a specimen. It needs no remark further than to notice that the cubical contents of each tak are calculated by means of tables. This saves much trouble, and a similar practice might be adopted in the case of works in this country. Something of the kind has been done already, see page 126 of Lieutenant Foord's "Notes on building &c." but more might be done with advantage.

97. We have also looked over the "specifications" used in the construction of some English Railways, as well as that prepared for the Madras Railway. The chief use of a specification appears to be to make it quite clear in the case of work offered on contract, how it is required to be done. In this country, where Public Works are most commonly executed by the officers of Government, there is less occasion for such a document; but even here it may often be a useful guide to the overseer or maistry in immediate charge of a work under construction, especially when there is in it any thing of a peculiar character. At present such special points are to some extent stated in the Engineer's diary or report; the purport of which is usually communicated to the person immediately executing the work. The specifications used in England appear to consist in great part of general directions as to the mode in which work of the various kinds should be done, and as to the principal points to attend to in each operation; and they are drawn up with much minuteness and detail. It appears to us superfluous and useless to repeat such general instructions on the occasion of every particular work. They are undoubtedly useful; but we are of opinion that their proper place is in a Manual or Code of instructions. One of the first measures after the establishments of the Public Works Department shall have been placed upon an efficient footing, should be to draw up such Manual or Manuals, which would contain all practical directions of a general nature. And if a specification should still be deemed necessary in the case of works of importance, and one may often be useful, it should be confined to some peculiar features of the work, or to matters in it specially requiring the attention of the executive agent.

SECTION II.

ON THE EXECUTIVE SYSTEM OF THE ROAD DEPARTMENT.

PART I.—GENERAL DESCRIPTION OF THE SYSTEM.

Introductory.

98. We now proceed to consider the Executive systems in use in all the three branches of the Public Works Department; that is both the Agency employed, the accounts kept of work in progress, and the mode of making up the bill from those accounts. We shall first take the Road Department; next, the Maramut or Revenue Department; and lastly the Military Department. The system in use in the Road Department skillfully and ingeniously devised, and on the whole carefully and ably worked out under efficient officers, is undoubtedly the best of all; and though in some minor particulars we shall have to suggest amendments, it is that which, with such modifications, we shall propose for general adoption throughout the whole Public Works Department. The system in the Revenue Department is no less certainly the very worst of all; and not simply bad by comparison, but bad absolutely and by itself, combining in no small degree all the evils which could perhaps exist in an executive system. It needs a thorough and entire reform; and in order to justify our condemnation of it, and the recommendations which we shall submit respecting it, it will be necessary to detail its actual working at considerable length. In the Military system we also find serious defects, though of a less injurious and less aggravated character than in the Revenue Department.

The system of the Road Department.

99. We begin then with the executive system of the road department, and the materials from which our information has been obtained are as follows. Lieutenant Forlong assistant to the Superintendent of the Roads, who was for nearly five years in immediate executive charge of the Western Trunk Road, and who also had charge of the new road from Arcot to Palamanair during the greater part of its construction, drew up, at our request, a paper explaining the system with considerable detail, and accompanied by a variety of documents in illustration. We also procured from the Superintendent's office, and carefully examined, a number of Account books of works in progress, besides bills and other documents, all illustrating the system; and we examined Overseer Hopkins of the department on various points.

We shall first give a general view of the system in use in the department, drawn chiefly from Lieutenant Forlong's paper. But it appears to us that a more exact idea of the operation of any system is conveyed by selecting one or more individual cases on a sufficiently large scale and minutely detailing them, than by any merely general description, however full and careful. We shall therefore, after giving that general view, take a specimen of each of the two main descriptions of work in the department; viz. for ordinary road work, a division of the western trunk road, and for bridge work, the Palmanair bridge lately constructed; and after minutely examining them, shall then detail the modifications of the system which seem expedient.

The agents employed.

100. We will first describe the staff of executive agents employed in the department. A road whether already made or about to be constructed, is divided into what are called "Districts" of six miles each; and the accounts of all these Districts are always kept separate. To each such "District" there is a Head roadman, who has charge of the Avenue trees, as well as of all tools, tools for belonging to the "District," he also repairs petty injuries, and reports

* The term "District" is a bad one in this sense, because the word is already appropriated to another sense in which it must very often occur in the Public Works Department, viz. in that of a Collectorate. It is also giving a forced meaning to the word to apply it to signify a length of road, its proper meaning being rather a circuit or Province. It might be better to adopt the word "Section" used on the Railway.

to the Pygust or Inspector immediately above him, all more serious damages to the road; all encroachments upon it, &c. The Head Roadman works in a different mile every day, and so goes over his whole charge in the course of the week. During the working season, when repairs are going on in his district, the head roadman directs the labourers, makes sections every few yards for them to work up to, &c. He is permanently aided by either a boy or a woman labourer; and wherever the traffic is heavy, there is also an Assistant Roadman. Both the Head Roadman and his Assistant live in huts close to the road in the middle of their district; the hut and enclosure belong to the department, and are useful as a dépôt for stores, tools, &c. and as a nursery of trees for the avenues.

101. Above the Roadmen are the Pygusts, of whom there is one to each district where the traffic, and consequently the work, is heavy, and only one to every two or more districts where it is light. This may be called the lowest class in the department, as the Roadmen are nothing more than labourers or coolies with a little more than the average intelligence. The Pygust has charge of the lining out, raising, metalling, and draining of the road; and he is also charged with the measuring of work, and the disbursing of tickets to labourers for work done. All persons are required to serve some time in this grade before attaining that of "Maistry."

Pygusts are paid by a salary. The "Conacapillays" are men of the same qualifications, who superintend the quarrying and preparing of material and the carting of it to the road, and who disburse the tickets for such work. These men being more out of view, are paid not by a salary, but by a commission. The pay of the Pygusts ranges from 5 to 12 Rupees, according to their qualifications and duties; the remuneration of the Conacapillays has about the same range, and the rate of commission allowed is carefully adjusted, according to the circumstances of the locality, so as to give such a sum in a month as is considered fitting.

The Pygusts and Conacapillays.

102. The next grade is that of the maistries; who are employed on masonry works only. While a road is in course of formation there is one Maistry to each considerable bridge, and one to each several small ones, or to those of one or two districts. After a road is completed there are no maistries permanently employed on it; but after every monsoon all the bridges are carefully examined by a maistry and all damage to the plastering or other parts, is then repaired.

The Maistries.

Above all these grades, and immediately under the Executive officer, are the "Overseers," one to every six or eight or ten districts, according to the amount of traffic; they are generally Europeans, but one or two are East Indians. An Overseer's charge is called a "division" of Road. The duty of the Overseer is to carry out the orders of the officer above him as to the execution of work; and he has to visit personally at least once in eight or ten days, all the work of all kinds going on within his division, and to cash the tickets which have been issued in the interval at the various works, by the Pygusts and Conacapillays.

The Overseers.

103. We must next describe the tickets and the mode in which they are used. The plan of paying labourers by means of tickets is not new, it has been adopted by many officers in charge of the construction of ghats or other works where large bodies of labourers were collected, as a means of preventing the men from being cheated. But it has never, so far as we are aware, been worked so carefully or so much reduced to a system, as in the Road department. There are four sorts of tickets in common use; viz. the man's ticket, the woman's ticket, the cart ticket, and the quarry ticket. Bricklayers, carpenters, and stonecutters are also always paid by tickets on large works, but not always on small ones; as workmen of these classes do not stay away or change from one work to another like the common labourers; and being few in number, a nominal roll is easily kept.

The ticket system.

104. The tickets are of card board, the several kinds diverse in shape, so as to be readily distinguished, and with various particulars noted on them. The first three of the four sorts of tickets above named do not vary in value throughout a division of road. They represent a day's hire respectively for a man, a woman, and a cart: but the quantity of any given kind of work necessary to earn a ticket varies from place to place according to circumstances. Quarry tickets represent a certain quantity of material excavated or prepared; they vary in amount at the several quarries, according to the ease or difficulty of working. But the nature of the material, the quantity, and the value, are all noted upon the ticket. As respects the cart tickets there is another particular to be noticed. The work done by the carts is bringing the material from the quarry to the road;

The several kinds of tickets.

but the distances to be travelled being unequal, the number of trips constituting a day's work varies at different places. Each quarry supplies a certain portion of the road, and for each quarter mile of this space, according to the distance from the quarry, there is a fixed rate of one trip, 1½ trip, 2 trips &c. to earn a ticket. A cartman is entitled to a ticket when he has made that number of trips; but some guarantee to him is necessary in the meanwhile that all his trips shall be counted. This want is met by subordinate tickets styled "Register tickets," one of which is given to the cartman on each trip; when he has made the proper number, he receives a cart ticket and returns the Register tickets. We will only add on the subject of the tickets, that all the several kinds contain such particulars noted on them respectively in initials and abbreviations, as enable the Overseer of the division not only to determine their value at a glance when presented for payment, but also to debit the proper Pygust or Conacapillay with the amount, and to know what amount of work done, or material prepared or carted to the road, he ought to find as a return for the tickets cashed, at every quarry, or in every mile of his division.

The tickets are cashed immediately on being presented to the Overseer of the division, no matter by whom they are presented. If any mistake has occurred (though such seem to be extremely rare) the issuer of the ticket and not the holder is responsible. This instant and unfailing payment has given the tickets the value of money; they are readily taken, and they pass from hand to hand as a medium of exchange.

The mode of cashing the tickets.

105. Tickets are used to secure prompt and full payment to the labourers; they do secure it, and the readiness with which the men enter into the system, and the cheapness of the rate at which they willingly work, (for no tahsildar or peon is ever asked to supply labourers to the Road Department, all is voluntary,) fully prove the success of the plan. But it is obvious that the tickets cannot be cashed as soon as issued, for if any fit person were at hand to cash them, he might pay the labourers at once in cash, and tickets would be unnecessary. The Overseer of each division visits every station where work is in progress periodically, as already said, and cashes all the tickets presented; but the holders need not wait for those visits, for the tickets are cashed whenever or wherever presented. In point of fact however the workmen find it more for their interest neither to retain the tickets till the overseer's visit, nor to lose their time in going after him to get them cashed; they pay them away to the bazarmen for the articles of their daily consumption, and they are readily taken at a small discount to cover the delay and trouble of getting them cashed. The greater part of the tickets are thus cashed to bazarmen, and some of that class appear even to make a business of cashing them for the sake of the discount they gain, quite apart from the sale of goods. This arrangement is profitable to all parties; but care is required that the visits of the Overseers to cash the tickets should be more frequent than in practice they have sometimes been. To prevent misconception, it may be well to add that there does not appear to be any connection or common interest between these bazarmen and the agents of the department: care should be taken however to watch against any such secret understanding.

Mode of tasking the labourers.

106. The quantity of work required to entitle to a man's or woman's ticket is determined at each new locality by actual trial. When work begins at any spot, the Executive officer or an Overseer goes there with a number of known good workmen: these are set to work, and are sometimes stimulated to exertion by promise of reward; the quantity of work done in a day by a man under these circumstances is taken as a day's work, and is fixed as the equivalent for a man's ticket at that quarry, or spot; and the same with the women. The people of the adjoining village or villages are invited to work at that rate; with the assurance that there will be no rolls of names or arrears of hire, but that a ticket will be instantly delivered on the performance of a day's work. Labour is always forthcoming on these terms; although as might be expected the average labourers by no means earn a ticket a day. Some good workmen earn more, and the excess is gladly paid; but in general and on the whole, the number of tickets issued in a day is somewhat less than the number of persons at work. The work being thus set agoing, the Over-

* With reference to the woman's tickets it may be explained that according to the country mode of working, earthwork is done by men and women together, generally in sets of a man and a woman each; the man digs the material, and the woman (often his wife) carries it to the proper spot on her head in a basket. This is a rude mode of doing work, which may be expected to disappear under an improved system.

seer leaves the Pygust or Conacapillay in charge, delivering to him a number of tickets of the various sorts required, sufficient to last till his (the Overseer's) next visit.

107. Thus the ticket system as here worked combines punctual payment with task work; and the result is a command of labour, and a cheapness of execution without close supervision, which have certainly not been attained elsewhere, except where tickets or daily payments have been the means, under immediate European superintendence. In the mode of working in the tank department under the Tahsildars, earth and rough stone work are done by the piece or by contract, being at so much a cubic yard; but the element of punctual payment being wanting, the result is endless delays. The men receive large advances and then there is great difficulty in getting them worked out, and after the work is done, there is long delay and great trouble to the labourers before the balance is paid. In the Road department no advances are given, and no labourer is ever in arrear, for the ticket is as good as money to him, and that is paid immediately.

The good results of the ticket system.

108. Besides its advantages in securing prompt and full payment to the workman and cheap and rapid work to the Government, this system has two other advantages; it saves much office work, and it economizes superintendence. Under the system of the Revenue department a list of the names of the people at work every day is kept, with their rates of hire; and as a security against fraud, a copy of this is required to be sent off daily, and in some districts even two copies, to distant offices. And when the men are to be paid, an account of the amount due to each is laboriously made out, and each man is required to affix his mark in testimony that he has received the amount set down; and this too forms a part of the record of the work. Under the ticket system all this is unnecessary. The Overseer when he cashes the tickets is enabled by the marks upon them, wherever he may be, to debit the amount to the proper work and the proper issuer; and when he visits that work he has no difficulty in comparing the quantity of work done with the number of tickets issued. In point of fact however tickets are rarely presented to be cashed except at the work itself, either by the labourers or more commonly by the bazarmen.

It also saves office work, and economizes superintendence.

Superintendence is economized by the use of tickets, because it is not necessary to pay for any great degree of probity in the officer who issues them, as there is so little possibility of fraud, on either the Government or the labourer. As to the former, the Overseer at each periodical visit compares the work done with the number of tickets issued, according to the proportion previously determined, and so detects any over issue. As to the labourers, the regular daily issue protects them. Each man knows well that he is entitled to a ticket for a day's work; and every man is strictly enjoined not to come to work again unless the ticket is given, and to complain to the Overseer on his next visit. Thus no man can be cheated of more than a single day's hire, except by his own fault, and it is not worth while to any Pygust or any Conacapillay to run the risk for such a trifle.

109. Another important and distinctive part of the road department system is the station books, which we must next describe. There are four kinds of these books; the quarry book, the Pygust's or road book, the cart book, and the bridge book. Of the first named sort of book every Conacapillay in charge of quarry work has one; thus there is usually a separate book to each quarry, but when two or three quarries, being near together, are under the charge of one Conacapillay, there is only one book for them all. Of the second and third description of books there is generally one to each "district" or six miles of road; but, according to the circumstances there are sometimes more and sometimes fewer. Of the bridge books there is commonly one to every large bridge under construction; and sometimes also in very large works, a subordinate book called a "bridge material book;" where two or three small bridges near together are under construction at the same time under one maistry, there is but one book for them all; and where a number of small bridges are to be successively constructed, there is only one book to each "district" of road. The books are closed at the end of each half year, and are then taken by the Overseer and sent to the Executive officer. Also at times when no work is going on at any quarry or bridge, or in any district, the book belonging to it, for that kind of work remains in the hands of the Overseer. The books are registered, and stamped on every leaf, in the office of the Superintendent of Roads, and short and clear rules for the guidance of the person in charge of them are bound up with them.

The station books.

110. The Pygust, Conacapillay, or Maistry enters in the book daily the number of persons employed and of tickets issued, and the quantity of work done; these officers are prohibited from keeping any other book or memorandum paper than this book, and every receipt, disbursement,

How they are used.

return &c. which may be made on account of the work is required to be found in it in original. When the Overseer comes he inspects the book, and compares the number of tickets issued with the amount of work that he finds. He also cashes all the tickets brought to him, and enters that number in the book as well as all which he has cashed for that work since his last visit, mentioning the date and place of payment, the sort of work &c. He affixes his signature to the entry, and the Maistry or other officer in charge of the book countersigns it in acknowledgment of its truth. It is one of the standing rules appended to the Overseer's cash book that he is never to pay money to any man through a third party, except that occasionally he is allowed to entrust a Maistry or Pygust with a small sum for the purchase of sundries during his absence; and every payment is required to be entered in the Station book, as well as in the Overseer's Cash book.

They form a complete record.

111. Whenever an Overseer visits a work, he inspects and initials the book, even though he may not pay out money; and the same with the executive officer. In the case of bridges the book contains the estimate and plan of the work; and every order given regarding it, and every remark by the Overseer or the superior officer, is entered in it. By this plan not only much labour is saved in preparing copies of orders for the several offices, but every order is always ready for reference just when and where it is wanted, instead of having to be hunted out of books of correspondence; and it is found to be an admirable mode of securing prompt and exact attention to orders. As soon as an order has been complied with, the fact is written across it in the book.

Thus the Station book forms a complete record of the work, quarry, or district, to which it belongs; of all the work done, and of all payments made, and all attested by the proper officers. And where the entries are properly made, all is so clear and concise that even a stranger visiting a work, sees at once all that has been done and is doing, and what the expenditure has been. These books are indeed the original vouchers for all the charges contained in the bills, except the small amount of sundries, for which separate receipts are taken. As such, great care is taken of them; they are examined by the executive officer when he visits the works, and again more minutely at the close of each half year or when the bills are made up, together with the Cash book of the Overseers.

They greatly diminish correspondence and reports.

112. The station books greatly save correspondence and periodical reports, which under other systems are so numerous and so bulky. No reports whatever are sent by the officers in charge of work to the Overseers; they have no correspondence with them, for all explanations are asked and received personally at the Overseer's visits, and his remarks are then entered in the book, and all his orders respecting it are likewise so entered. Every Maistry, Pygust, or other person in charge of work, however, sends to the executive officer every month, an abstract of his station book for the month; this abstract is brief, but is sufficient to keep the officer well acquainted with all that has been done and is doing at every place within his charge where work is in progress. The executive officer also receives every week from Overseers, Maistries, and Apprentices, brief journals or diaries, stating where they were each day, and all their official acts and proceedings. The diaries of officers in charge of money, contain also an abstract of their cash books, brought up to the end of the week, with notice of their probable expenditure and the amount of money they require, for the ensuing week. These diaries are very short, being generally comprised in half a sheet of foolscap paper, often in less than one side of it.

What books an Overseer keeps.

113. Under these arrangements the Overseer has very little correspondence, and his in-door work is reduced to a very small amount. He has six books to keep; 1st the cash book; 2nd one containing the ticket account current at one end, and the store account at the other; 3rd one for the establishment and the sundry account; 4th one for his rough diaries, and for copies of letters, returns, &c. despatched; 5th letters and papers received; 6th a receipt book, in which are entered or pasted the receipts taken for small sums paid for sundry charges. Of these books the principal one is the cash book, and the only one which takes much time.

An Assistant Superintendent of Roads, or executive officer, sends monthly reports on the roads under his charge to the Superintendent, which are forwarded by that officer to Government with his own Monthly Report. He also sends at the same time for the information of the Superintendent himself, a cash memo. and his Overseers' diaries.

PART II.—DETAILED EXAMINATION OF THE ACCOUNTS OF CERTAIN WORKS, IN ILLUSTRATION OF THE SYSTEM.

114. Having thus given a general view of the executive system of the Road department, we now go on to illustrate its practical working; for which purpose we take the accounts and bills of the 1st division of the Western Trunk road for the half year ending October 31, 1852, and the accounts and bill for the bridge lately built across the Palmanair river. Having examined these, we shall then state the few amendments which seem to us to be required, all of which will have in view the simplification of the accounts.

The books of the First Division of the Western Trunk Road.

The first division of the western trunk road is thirty miles in length; it extends from the third milestone, (up to which point the road is included among the Presidency roads,) to the 33rd milestone. Being the section of the road the nearest to the Presidency the traffic is very heavy, and of course the repairs are proportionally large. This is the reason why the length of this division of the road is so limited.

The work done during the half year that we have taken, consisted entirely of repairs to the surface of the road. The whole expenditure in the half year, including superintendence, was Rs. 26,102-7-8; the amount was provided partly out of the ordinary annual allowance for keeping up the road, while a part was out of the sum of 1,16,000 Rupees specially sanctioned by Government in 1852, for improving its condition.

115. The detailed accounts for the work are contained in the following books, which we will briefly describe.

The detailed accounts of the work.

The Quarry Books,	The Roller Book,
The Cartage Books,	The Receipt Book,
The Road Books,	The Cash Book.

The Quarry Book as already explained is the record of the cost of preparing (or collecting as it is termed in the department) the material for the road, and is kept by the Conacapillay in charge of the quarry or quarries to which it refers. It shows the number of labourers employed each day, the description of material quarried, whether stone, laterite, or gravel, with the rate allowed at the quarry for each heap, the number of heaps prepared, and of tickets received and issued. All these particulars are filled in daily: the last column is left blank till the Overseer comes to the quarry, when he counts up the number of tickets issued, each of which represents a heap of the material, and also counts the number of heaps quarried, measuring such as may appear too small to his practised eye, and making deduction for those actually found to be so. He then enters in the vacant column of the book the number of full sized heaps, their value according to the established rate of the quarry, and the date, and certifies that he has that day counted, measured and paid for them. And then, after making a corresponding entry in his Cash book, he pays the amount to the ticket holders, and redeems the tickets.

The Quarry book.

116. The Cartage Book contains corresponding particulars, viz. the description of material, the quarry from which, and the mile to which, the material is carried; the number of trips for a ticket in each case, the number of carts employed, of loads carted, and of tickets received and disbursed daily. The last column is used in the same way as in the quarry books, when the Overseer in his periodical visits goes along the road, counts and measures the heaps, and cashes the tickets.

The Cartage and Road books.

The Road Book is kept by the Pygust. It shows the total number of men and women employed daily in his "District," their distribution on the various sorts of work, and the quantity of work performed by them; it shows also the number of tickets received, and issued daily. The various species of work are arranged in columns: they are as follow: earthwork, spreading jelly, spreading gravel, watering and ramming the surface, clearing channels, hedging trees, removing

earth and so on. The items vary from time to time according to the sorts of work in progress, and it does not appear that there is any regular arrangement for them. The last column, as in the former two cases, is filled up by the Overseer, when he goes over the road, examines the work, and cashes the tickets.

The Roller book
and Receipt
book.

117. There is a roller employed in this Division to smooth the newly formed surface, and a "roller book" to show the miles in which the roller works each day, and the number of trips. This kind of work is not paid for by tickets; but the bullocks employed to draw the roller are hired at a certain rate a month, and the Overseer certifies in the book from time to time that the entries are correct, and at the end of the month notes in it when he pays the hire. The roller book is kept by the roller Conacapillay.

The receipt book is kept by the Overseer; its intention is that he should enter in it the receipts from all parties to whom he may pay money for "Sundries," that is for charges not included in any of the various station books, and should take the signatures of the recipients. This however is not done, as it is alleged to be impracticable to have the party receiving money always present to sign in the book. The receipts are therefore taken in many instances on separate pieces of paper; but in order to conform as far as possible to the rule in the department which prohibits such loose papers, they are all pasted into the receipt book. This book for the 1st division of the western trunk road is not kept at all neatly or carefully: almost the whole of the receipts are on these loose slips, and they are pasted into the book in a slovenly way without due arrangement, and without being numbered. It is thus very difficult to compare the charges with them: we shall recur to this by and by.

The Cash book.

118. Such are the station books for this work: they contain the whole detailed accounts of the expenses except the establishment and sundries. With that exception they are in fact the original vouchers for the whole of the charges; but the bills are not made out from them, but from the Cash book. We now go on to describe the cash book; and after that, we shall detail the mode of preparing the bills.

When the Overseer visits a quarry or road and cashes tickets for work done, he enters the particulars, as already said, in the station book; and at the same time, in entering the disbursement in his cash book, he gives the same particulars, and even some in addition, taken from the other columns of the station book. Thus from the quarry book all the particulars of the material prepared are entered in the cash book such as the number of heaps, the name of the quarry, the rate for each heap and the whole amount paid. In each entry a reference is made to the particular quarry book in which the corresponding entry, as well as all the daily details, is to be found. From the cartage book also in the same way the necessary particulars are taken and entered in the cash book; such as the number of carts or tickets, from what quarry conveyed and to what mile, with the number of trips for a ticket in each case, and the amount paid; here too there is a reference to the station book in which the details are to be found.

How the entries
in it are made.

119. The road book divides the labour employed into a variety of items, but in the cash book all these are entered under two descriptions; viz. spreadage, or the spreading of the material on the road, and miscellaneous earthwork. The entry of payment shows the number of men's and women's tickets cashed for each of those two species of work, the rates of payment, being the same in both cases, and the total amount of payment, with a reference to the station book. Lastly when the hire of the cattle employed to draw the roller is paid at the end of the month, the number of pairs of bullocks, the period for which the payment is made, and the rate of hire, are taken from the roller book, and entered in the cash book. Thus the payments of the above four descriptions, entered in the cash book are supported by the station books. In the case of sundries, every payment is supported by receipts which are to be found in the receipt book: the charges on this account are chiefly for the purchase of stationery, tools and implements, and various other articles. Besides these five descriptions of charges there is the pay of the establishment; this disbursement is supported by two monthly acquittance rolls, viz. one for the Overseer's pay and one for that of the Native establishment. After the end of the half year the Overseer totals the cash book, and enters the total in pencil; and he then sends off the cash book, all the station books, the acquittance rolls and the receipt book, to the office of the Assistant Superintendent in charge of the line.

120. The next operation is the preparation of the bills, for which purpose all the foregoing materials are put into the hands of the accountant of the Assistant Superintendent's office, who proceeds as follows. He first compares the total payments in the cash book with the total of those entered in the several station books and other vouchers, but he never examines the details of the station books. The totals being found to agree, the accountant next examines the additions in the cash book, and enters the total amount in ink; and he then proceeds to prepare the several bills from the cash book.

In making the bills, the charges in this Department are divided under six heads, for each of which there is a separate bill for each division of road every half year. The following are these heads: viz. collection of material, cartage of material, spreading the material on the road, earthwork, sundry labour, and sundry charges. In preparing the bills the first thing is to prepare a general abstract from the cash book, shewing the total charges there found under each of the heads just enumerated. The several sums are posted under those heads just as they are found in the cash book; and as they are extracted, a number is entered in a column of the cash book provided for the purpose, shew to the column in the abstract to which the sums are taken. All these sums under the different heads are totalled and if there is no error the grand total corresponds with the total amount previously entered in the cash book.

121. This being done the accountant proceeds to collect details from the cash book for the preparation of the several bills. Bill No. 1 is for the collection of materials. To make out this bill the Accountant goes through the whole six months' cash book, extracting all the entries of payments on this account. These entries are all arranged under the various quarries to which they belong; and it may be observed that there are sixteen quarries in the division of road of which we are now speaking. Under each quarry are entered the description of material, whether stone, laterite, or gravel, the number of heaps excavated or prepared, the quantity in each heap, and the amount paid. After the whole items are thus entered, the sums under the several quarries are totalled; and in doing this, the total number of heaps, and amount for each description of material, is entered under each head. All these totals are consecutively placed in a separate part of the paper and then added together; and the aggregate is compared with the total entered under that head in the general abstract originally prepared. From this abstract the items thus obtained form the bill; it shows the number of heaps of each description of material collected at each quarry, with the rate per heap, and the total amount; after all the items are entered in the bill, the calculations are examined, and if there should be any error, the correct amount is entered in the bill, and the difference is adjusted in the Overseer's accounts.

122. The preparation of this bill is thus no simple or easy matter; but that of the bill for cartage is still much more arduous, requiring a variety of processes one after another. First, an abstract is prepared, in which a column is opened for every mile to which material was carted. Under each mile all the entries of materials of each kind carted to that mile are posted as found throughout the six months' cash book. The entries show the number of tickets issued for cartage to each mile, the number of trips to each ticket in each case, whether 1, 1½, 2, 3, 4, &c.; and then the total of tickets is given under each mile. From this abstract a second is prepared in which all the entries of cartage at each rate of trips per ticket are arranged under each mile; and then the total number of tickets for each description of material, at each rate of trips per ticket, is taken from the first abstract and entered in this. The number of tickets being then multiplied by the rate of trips, the product is put down as the number of loads; this is done for each description of material under each mile; and from this abstract the bill is prepared. The bill shows the number of cart loads of each description of material to each particular mile at each rate of trips; and the several sums are to be calculated one after another. The number of loads at each rate of trips per ticket, is divided by that number or rate, whether 1½, 1½, 2, and so on; and the quotients being added together, the total is multiplied by 6, six annas being the uniform value of each cart ticket, and the product is then entered in the bill, as the amount of that item. This tedious and complicated process is gone through for the whole of the items in the bill which are not less than one hundred and ten. Then the whole 110 sums are added together, and if there is no error the total corresponds with the amount in the general abstract. If it is not found to correspond, which may often happen as the result of such numerous and complex operations, all the items have to be again severally examined and the whole process has to be gone through, to find out the error. If it is found ultimately that the total falls short of the sum paid, the difference is disallowed in the bill, and the Overseer is made to pay the amount.

The mode of pre-
paring the bills.

The bill for collec-
tion of materials.

The bill for cart-
age.

The bill for spreadage.

123. Bill No. 3 is for spreadage. For the preparation of this, an abstract is drawn up, in which all the entries in the cash book throughout the six months in each of the "districts" of the division of road are separately shewn, viz. the number of men's and women's tickets issued. At the foot of the table the total number for each district is added up, and the value being found by multiplying the number by the rate, is entered in another column. These totals are then transferred to the bill, which thus shows the total number of men and of women labourers employed in each district of road during the six months, the rate of hire for each of the two classes, and the total expenditure on this account in each district.

The bill for earthwork.

Bill No. 4 for "Earthwork" is made up in the same manner. The details of both these items as above explained are found in the road book, and the Overseer in cashing the tickets notes how many of the whole number were for spreadage, and how many for earthwork. In making the bill for earthwork therefore an abstract is made from the cash book in the same manner as that for spreadage, and the items of the bill are entered in the same way. The united amount of these two bills is tested by comparison with the amount of payments found in the road book, as entered in the general abstract first prepared, with which it ought to correspond.

For sundry labour.

124. The head of "Sundry labour" comprises the pay of labourers of various kinds, employed not on daily wages but on monthly pay. The classes included under this head are for the most part the deputy roadmen, who are entertained while work is actively in progress, the people employed to water the trees by the road side, and a few others. In making out this bill, all the entries are extracted from the cash book and classed under the several districts of road, and the totals of all are the amount of the bill. But this abstract is apparently only used to check the total, for in the bill the particulars of districts are not shown, while other particulars are, viz. the various rates of pay of the coolies employed, which are not found in the abstract; it seems therefore that some other abstract is used in preparing the bill, which was not sent to us. There is something not quite satisfactory in the mode in which the charges for sundry labour are incurred, without adequate authority or sufficient voucher or check; we shall recur to this by and by.

For sundry charges.

For the bill for sundry charges an abstract is made out from the cash book arranging the different items under distinct heads, such as purchase of iron, repair of old and new hammers, and so on. From this the bill is prepared with full details, the quantity and rate of each description of article being given; and the total of this is checked by comparison with the general abstract.

The several bills having been thus prepared from the cash book by the accountant in the Assistant Superintendent's office, are sent to the Overseer, who after seeing that their aggregate amount corresponds with the total amount of his cash book of which he had kept a note when forwarding that and the other books, affixes his signature to them and returns them. The Assistant Superintendent then countersigns them, and forwards them to the office of the Superintendent.

The books of the construction of the Palmanair Bridge.

125. The papers before us connected with the Palmanair bridge are still defective though we have made repeated application to the officers of the department to obtain them complete. Lieut. Chauncy the Acting Assistant Superintendent in charge of the line of road, informs us (Letter March 25, 1853) that the work commenced on the 5th April 1851, but the earliest accounts of it in our possession begin from the 22d December of that year. We have accounts from that date to the 31st October 1852, but even they are not complete and are very far from being in good order or well kept. Those for the succeeding half year ending 30th April 1853, in which the work was advancing, are not likely to be ready in time for us to include them in this review. The estimate for the bridge amounted to Rs. 6,206-8; the expenditure up to the 31st October was Rs. 3,360-13-6, and at the date of Lieut. Chauncy's letter above quoted, the work was still unfinished. Delay in the erection of a bridge however cannot be judged of like that in the construction of an ordinary building, the work being much more dependent on season. Thus, although the work was begun on the 5th April, yet the usual freshes in the river probably began in May or June, and interrupted the work; and later in the year it must have been entirely broken off on account of the monsoon. In point of fact there was very little work done in 1851; in 1852 the work was prosecuted vigorously, and before the end of October we know that the structure was completed with the exception of the plastering and the parapets, and was opened to the public; temporary railings being put up in lieu of parapets. The remaining work was purposely postponed till after the N. E. monsoon of 1852, and will probably be finished this year.

126. The papers which we have received respecting the bridge are the following: a bridge book in three parts, extending from the 22d December 1851 to the 31st October 1852; a cash book in two parts, for the Division of road in which the bridge is situated, for the half years ending 30th April and 31st October 1852; and three bills for work to the bridge, one up to December 31, 1851, the next to the 30th April 1852, and the third to the 31st October 1852. The first bill is entirely unsupported by any documents before us, and we shall take no notice of it further than to say that the amount, viz. Rs. 570-9-3, shows that as already said the work done up to that time was not much. We are not informed why this bill was prepared; according to the practice of the department the first bill should have been for expenditure up to 31st October 1851, (supposing a bill for the part of April to have been thought unnecessary,) and the second up to the 30th April 1852.

Description of the accounts received.

127. The first part of the bridge or station book extends from the 22d December 1851, to the 30th April 1852; the second is from the 1st May 1852 to the 13th June, but all the entries in this book after the 8th May have been transcribed into the third book, which extends from the 9th May to the 31st October.

The first part of the bridge book.

The 1st of these books contains daily muster rolls of all the labourers employed on the work from the 22d December 1851 to 30th April 1852. There are separate lists for the bricklayers, the carpenters, the stonemasons, the ironsmiths, and the men and the women coolies; and of the coolies two lists, one for those employed on the bridge and the other for those on the approaches. These lists show the names and villages of all the people employed, the days on which they worked, and the rate of daily hire for each. The names are in a column on the left hand, and there are columns, one for each date, all across the book to the left. When the Overseer visited the work he counted the days that each man had worked, computed the amount due, and paid it up to that very day, noting that circumstance in the book with the date and his own signature. But the payments were far less frequent than they ought to have been; and than they ostensibly are in the department. The hire due for the whole time from the 22d December to 17th February was paid on the 19th February; from the 22d February to 20th March was paid on the 21st March; from the 22d March to the 30th April, and as we find in the second book, up to the 7th May, was paid on the last mentioned day. Thus in four months and a half there were only three payments, being an average interval of six weeks between the payment of wages, instead of eight or ten days at the outside, as stated by Lieutenant Forlong to be usual.

128. The second book is similar in form to the first; except that it contains bricklayers and labourers only, no other classes having been employed during the time to which it refers, viz. from the 1st to the 7th May.

The second part of it.

These muster rolls are on the whole pretty well kept; and indeed they are so simple and easy, that it is difficult to blunder in keeping them. But it must be observed that throughout these two books, we have no record of any materials having been received or expended, and that for all that appears in them all the numerous bricklayers had been working without either bricks or mortar. Some documents on that point relating to this period are improperly appended to the third part of the bridge book, but not by any means the whole; whether the remainder have any existence we do not know, but at least they are not in the station book, where they ought to be.

129. The third book exhibits a marked improvement in fullness of information, as well as in neatness and order; but even this is defective in some points. The book contains at one end daily muster rolls of work-people similar to those in the former books, and at the other a "Report" as it is called, which shows in abstract the number of labourers of the different classes, whether paid on acquittance roll or by tickets, also tickets received, receipts of materials, quantity of work done, amounts advanced, and daily total of expenditure. The last column is left blank as in the station books already described, for the Overseer to record his payments. There are also other accounts of which we shall speak presently.

The third part of it.

From the 9th May to the 13th June in this book there are muster rolls for all classes of workmen employed, as in the former book. But after the latter date a change was made; the artisans continued to be paid on muster roll, and the rolls for them run on to the close of the half year; but the common labourers began after the 13th June to be paid by tickets, and the muster rolls for those classes cease. The "Report" at the other end of the book ought to show the receipt and issue of tickets but it does not show the former very punctually, and there is no

direct information as to the latter: the number of men and women coolies employed is however given, and as they do not work task-work the number of tickets must be the same. Thus the accounts are kept, down to the end of the half year; and on the whole they are kept punctually and well. But in this period also we noticed that the payments are less frequent than they ought to be. After the 7th May, the payments were on the 15th and 27th June, the 6th, 20th, and 31st July, the 17th August, the 8th September, the 7th October, and the 14th November; on which last day the people were paid up to the 11th November. Thus putting aside the month of July in which the settlements were more frequent, the intervals between the payments averaged twenty six days, and some exceeded a month.

Its contents further described.

130. In the middle part of the book are a number of accounts current shewing the advances made to the various contractors, whether for chunam, bricks, or rough stone, and the quantities of materials delivered. There is a separate account for each contractor, and each one supplies only one material; these accounts are kept in a clear and good form, one side shows the advances, the other the quantities of the material delivered, and their value at the contract rate. The advances are all made by the Overseer, and at the close of the half year he squares the account, carrying forward any balance that may remain on either side to the next half year's account.

Besides these accounts there are also in the same book, lists of tools at the bridge, and accounts of sundry expenditure; which last are settled by the Overseer in the same manner as other accounts.

Appended to the book are a number of engagements executed by parties for supplying bricks and chunam for the bridge, and receipts for advances for cart hire, &c. None of these engagements, six in number belong properly to this period, all being dated between the 22nd January and 22nd April, so that they ought to have been attached to the accounts of the previous half year, which we have spoken of as being so incomplete. Of the thirty receipts also, thirteen belong to the previous half year. The receipts are all written in a book, and the signature or mark of the party receiving is appended; this is an improvement on the practice in use on the Division of road before reviewed, where they are all on loose paper; but it would be simpler still to take the acknowledgment of the party in the Account Current. The whole amount of the thirty receipts is Rupees 93-12-0: one is for Rupees 41-4-0, and five sums are for Rupees 52-8-0; the remaining twenty four are for the aggregate amount of only Rupees 72-6-0, being Rupees 3-0-3 for each receipt. In some cases, and where the advances were much larger than the above, the mode now suggested was followed, the signature, or in some cases the mark, of the recipients being taken in the Account Current; we think it would have been better if this plan had been invariably followed.

The Cash books.

131. As for the Cash Books for this work, we received none for the earlier part of the expenditure; the two which we did receive were for the half years ending 30th April, and 31st October, 1852. The former indeed though it purports to commence from the 1st November 1851, and close with the 30th April 1852, yet in fact begins from the 14th September 1851, and goes on till the 29th May 1852, or rather till the close of that month. It is badly kept, and is almost entirely without dates or other necessary particulars. The reason of this is that Overseer Smythe then in charge of the bridge and road, kept no accounts; and ultimately, when this was found out, accountants were employed to go over his vouchers and make up his books. This having been done he was brought in a defaulter to the amount of Rupees 270-10-11, but whether from embezzlement or from his vouchers having been lost, is not clear. The man was sentenced to make good the amount, but he died. These being the circumstances we shall take no notice of this book, especially as the bridge book for the same period is also defective, as already said. But we cannot avoid remarking that the officer immediately superior to Overseer Smythe appears to us to be not free from blame in this matter. Had he been duly careful to see that his subordinate kept his accounts properly, (and it would have required only a few minutes of his time when in company with the Overseer, to ascertain whether he did so or not,) his entire neglect in this particular could not have gone on undiscovered for more than a short time. Then either the Overseer would have been obliged to write them up at once, or if found incapable of doing so he would have been removed from the department; in either case he would probably have been saved from ruin and death. This case is a strong instance, and indeed less strongly the whole accounts of this bridge are an instance also, how necessary it is as we urged in our first report, that the executive agents

of all grades in the department should be well instructed in accounts; and it also exemplifies the necessity of requiring that the superior local officers should enforce on their subordinates due attention to that part of their duty.

132. The other book, ostensibly for the half year ending October 31, 1852, commences on the 2nd June, and contains entries to the 21st November. This book is on the whole carefully and regularly kept by Overseer Damerum, though some irregularities are found which will be noticed presently. It resembles the cash books above described on No. 1. Trunk Road. The payments are entered with such detail as is sufficient for making out the bill; and the bill is in fact made from the cash book. The chief defect in the mode of keeping this book is that wages paid to labourers are debited as advances, and are afterwards scored through and entered in the column of actual payments. The mode of entering the advances is also objectionable as will be remarked presently.

The second cash book.

133. Three bills were sent us for this bridge, marked A, B, and C. The first is for work done up to the 21st December 1851, to the amount of Rs. 570-9-3; the second, to the 30th April 1852, to the amount of Rs. 545-4-3; and the third to the 31st October 1852, Rs. 2245-0-0. The bills were prepared from the Cash book by means of intermediate abstracts, in the following manner. All payments relating to the bridge were extracted from the cash book, and arranged under seven or eight general heads, such as bricklayers, carpenters, bricks, chunam, &c.; and these heads are subdivided according to the rates of hire of workmen, and prices of materials. These several subdivisions are then summed up separately and the totals are taken to the bill. Then come the sundries; these are all extracted seriatim from the six months cash book and formed into a list, which is afterwards somewhat condensed by classing together charges for similar objects. The sundries are still entered with a useless amount of detail. In the Bill C, there are thirty one items of sundries each under 5 Rupees and amounting in the aggregate to only Rupees 45-0-8. Many of these entries are under one Rupee and some are below an Anna. The smallest is four pice for a single quill. Nothing useful would be lost if all these trifling expenditures were massed in a single entry in the bill, as "sundry charges not exceeding 5 Rupees each."

The bills how prepared.

134. Of the three bills, C only has been compared with the cash book and station book, the books for the other bills being very incomplete. Even for that bill, they were less clear than those of No. 1. Trunk Road, and the comparison was not made without some difficulty. Being made however, the bill was found to agree entirely with the books, and they with each other, with the exception of a few very trifling errors, most of them mere slips of the pen. The bill agrees exactly however with the cash book; and the materials for comparing both with the station books are at hand and in a small compass. The steps also by which the bill is prepared from the cash book, though not quite so direct as by a better arrangement of the latter they might be made, are still simple and easily traceable. And though this may be thought a small matter now, yet when we come to speak of the executive system and the accounts of the Revenue Department, it will appear far from unimportant in the contrast. In the voluminous accounts sent to us of works in that department we sought in vain for any proper and legitimate connection between the bills and the detailed accounts of work; while we found in those accounts themselves a confusion and a mystification which contrast most strikingly with the straightforward and transparent modes of proceeding obtaining in the Road department. And in the matter of bulkiness also the latter system has a very great advantage. The whole of the accounts of the expenditure on the Palmanair bridge for the six months ending October 31, 1852, amounting to 2,245 Rupees are contained in less than twenty sheets of paper smaller than foolscap, even including all the detached receipts and agreements belonging to that period. We will not here anticipate what we shall have to say of the Revenue department on this point, but we may observe that the accounts of a similar work in that department would certainly have extended to many times twenty times that bulk, and after all without showing any clear results.

Remarks on the accounts of the bridge.

135. In closing our notice of these two sets of accounts in the Road Department (viz. of the 1st division of the western trunk road and the Palmanair bridge,) we must observe that although the system and forms are undoubtedly good, being both clear and simple; yet that a little more strictness is needed in enforcing adherence to the rules laid down; we will give some instances of departure from these rules, all met with in these few accounts.

The system of accounts, in the Department is good, but the rules are not duly enforced.

Instances.

In the first rule attached to the cash books it is ordered that they shall be balanced daily; this is not done.

The second rule directs that all payments shall be entered also in the station books; in some instances we found this omitted in the books of No. 1. division, no entry was found for the payment for certain heaps of gravel. The rule also prescribes that both the date and the place of payment shall be entered in the station books; the place is hardly ever entered, and in many cases the date is omitted also.

The 4th rule requires that the monthly establishment rolls shall be entered in a book, but they are kept on loose papers. There is also a second establishment for "sundry labour" as it is called, for which there is no other voucher than an establishment book kept by the Overseer, which is much wanting in clearness and which contains some names mentioned also in the other acquittance rolls above spoken of.

The 5th rule directs that the cash book shall be closed every half year, but this is by no means strictly observed.

The 8th rule directs that in case of advances made to contractors or others, the cash book shall specify certain particulars; but those particulars are in fact not to be found in the book.

The 9th rule directs that when advances are adjusted by the settlement of an account, the previous entries of advances shall be scored through, and the whole sum shall be entered as a disbursement, with notice of the dates &c. of the previous advances. In practice this rule is disregarded; the advances are scored through, but no reference is given in the debit of the charge to the date of the advance, and it is thus impossible to test the correctness of the entries.

Irregular entries in the cash books.

136. Further it is the most essential rule in all accounts that every entry shall be a fact, that the transactions shall be recorded just as they occur; but this rule is not uniformly adhered to. In Mr. Hopkins' cash book we find the whole of the salaries of his establishment for a month debited at once, though it is certain that they are not all paid at once. Again in the cash book for October 1852, we found no payment from the 5th to the 30th but on the latter date a long string of payments occupying six pages, and at many different stations. It was clear that this was not a true entry, and on enquiry we learnt that from the 5th October to the end of the month the Overseer was without money, and that after he received a supply he went over his division and cashed all the tickets issued up to the end of October and entered them as paid in that month, though some of them were in fact not paid till late in November. It must have been owing to want of due forethought or arrangement in some quarter that the Overseer was so long without money; but at all events it was his duty to enter the payment on the dates when they occurred, and not to falsify his accounts, however innocent may have been his motive. The cash book for October was in fact kept unclosed till the end of November in order to enter these payments. The practice of falsifying dates should never be permitted in any case; if once allowed to enter, there is no saying where it will stop.

The payments too unfrequent.

We have already spoken of the unfrequency of the payments at the Palmanair bridge, and we must remark that in the 1st division of the trunk road also the payments were much less frequent than the system ostensibly requires. An examination of the station books shows that the interval between payments was rarely less than fifteen days, while in many instances it exceeded thirty; whether this result is owing to want of activity on the part of the Overseer, or to want of due forethought in keeping him supplied with funds, it appears to require correction.

PART III.—SOME IMPROVEMENTS SUGGESTED.

137. Highly as we approve, on the whole, the executive accounts in the road department, as being both concise and lucid, they still appear to us to be susceptible of improvement in both respects; and we shall conclude our notice of the system with some suggestions to that end. We have caused to be prepared a complete set of station books cash book and bill, in the forms which we propose; these will be found in Appendix H and I, and we will make a few remarks upon them. We should add that we placed the whole of our proposed forms in the hands of Lieutenant Chauncy for his opinion; and that they now appear with the changes and additions which his remarks suggested.

Amended forms for the several books.

Appendix H contains specimens of the proposed forms for the following books and papers for ordinary road work.

Quarry book.	Establishment book.
Cartage book.	Cash book.
Road book.	Abstract of Cash book.
Roller book.	Bill.

They are all filled up from the corresponding actual books of Overseer Hopkins' division already described. We had prepared a complete set of books and bill for two "districts" of that division, in order to show more clearly the connection and harmony of the whole; but finding that these would occupy more space than we thought should be given to them, we abandoned the idea of printing the whole in the Appendix, and give specimens only. Still, the cash book the Abstract of it and the bill are complete, and exactly illustrate the proposed mode of preparing the bills.

138. In the first two forms, viz. for the quarry and cartage books, (Appendix H, 1 and 2) there is but little alteration. They have been abridged by omitting some unnecessary columns, so as to make the books more compact and handy. The proposed form may be easily written on a page half the width of a page of foolscap; and this compactness is important in papers so much handled and carried about. The only material change is in the payment column, which is required to show the same particulars as are to be entered in the cash book. Under the present practice this column shows only the total amount paid at each time of paying; the particulars of the different sorts of materials, to be entered in the cash book, being taken afterwards from the other columns. It is already necessary that those particulars should be ascertained, before the total can be known; the proposed plan therefore involves no new labor but that of setting down the ascertained quantities in the last column, while it saves that of afterward referring again to all the columns. A still further gain will be to make the examination and comparison of the cash book and station book very simple and easy; for it will be only necessary first to go through the station book and to see that these totals are correctly set down in the last column, and then taking the cash book, merely to compare the entries there with those in the last column of the station book.

The Quarry and Cartage books.

139. In the road book (Appendix H, 3) there is not much change, except in the arrangement of the headings for the different kinds of work. The classification which we propose is as follows, earthwork, spreading gravel, spreading jelly, repairing road, (such as watering, stamping, levelling, &c.) hedging trees, cutting channels, repairs of masonry, and sundry work, to include all other sorts. The use of subdividing the labour in the accounts is only to aid the executive officer of the road in checking them, and the extent of subdivision here given seems to us to be sufficient. At present it is usual to enter the earthwork separately in the cash book, and all the other sorts of labour clubbed together; and in like manner separate bills are prepared, one for the earthwork and another for all the remaining kinds. The use of this is not apparent, and one common term, such as "repairing road," might be made to include the whole.

The Road book.

The form proposed for the roller book is simpler and more regular than the present form.

The first page of every Station book should contain distinctly and briefly written the orders given to the man in charge of it, as to the quantity of work to be done by each labourer, the rate of hire, the size of heap of materials, and other particulars. There is already a rule to this effect, but it is not complied with. The station books are now written on very bad and perishable paper; serviceable French paper being so very cheap, this should not continue.

The Establishment book.

140. The next book is the Establishment book (Appendix H, 6); and as respects this, a material change seems to be expedient, not simply in the form of the book, but in the system in use. At present two acquittance rolls are prepared every month in each Division of road, one for the Overseer's own pay, and a second for that of all the other servants. The latter vary much in number and amount from month to month; for, besides the servants whom it is usual to maintain permanently on the roads, others are entertained and dismissed, as the work may increase or diminish. Here two things are mixed up, which have no natural or proper connection, viz., a permanent establishment and services casually and temporarily engaged. And not only ought the two to be kept separate, but we are of opinion that the present course followed with respect to both is erroneous.

Irregular mode of charging the fixed establishment.

141. Under the present practice a part only of the permanent establishment is so charged, while the greater part is charged in bills for work done by the department. The writers and accountants, the mere office servants, are paid as an establishment; but all the rest, overseers, maistries, apprentices, pygusts, lascars, &c., who are quite as permanent as the first mentioned in every thing but the name, are paid out of the estimates, and the charge is included in the bills for work. In all other departments the fixed establishment is sanctioned once for all, and the disbursements of salary are brought under due audit and check in a connected form in the proper office: in the road department not only is the sanction of Government repeated every half year, but it is repeated in detached portions; and the establishment never comes under view as a whole but always piece-meal, distributed over a number of separate bills for works done on estimate. We can see no reason why the Road department should be made an exception in this respect, to a rule which has been found so wholesome in other branches of the administration. And we beg to recommend that all the servants in the department who are in fact permanent, should be included in the fixed establishment and dealt with accordingly. Each Overseer in charge of a division of road will then send in to his next superior officer every month, a single acquittance roll of the salaries of himself, and subordinates; and all these rolls will go up for audit in the proper office in the usual and regular manner.

The temporary Superintendence.

142. The temporary part of the establishment is entertained or discontinued by the Overseer as occasion requires; and apparently under very little check. Overseer Hopkins declared indeed that no change is made in the number of persons employed without the order of the Assistant Superintendent, but this order is only verbal. We are well aware that enlargement or diminution of the number of servants employed must often be expedient according to the season and the amount of work in hand, and we are far from wishing to lessen the discretion now allowed to the executive officers in this respect; but the exercise of it ought to be under some regulation; and it seems undesirable that the same individual shall both entertain and pay the men. Before stating the change which we propose, we will speak of the "sundry labour book," as the same alteration is needed in that also.

Sundry labour.

The Sundry labour book is a roll of the names of labourers engaged by the month. The labourers thus paid are for the most part those employed during the dry season in watering the trees planted along the road side. This book is very irregularly kept, nor in its present form can it be regarded as a sufficient voucher for the bill for sundry labour, or for any charge at all. It may be very proper that certain kinds of labourers should be engaged by the month, and there is no objection to the practice; but here as in the case of the temporary establishment a change is required, such as shall place this part of the expenditure under due regulation and check, and shall abolish the practice which places in the same hands the entertaining of new labourers and the paying of them.

Both the foregoing should be charged in the Station books.

143. And in both cases we think the suitable remedy will most simply and effectively be found by resorting to the "Station books." The basis of the executive arrangements of the road department is that the road district is the unit of the system. Lieut. Forlong accordingly tells us in his

memorandum that the records of each such district are kept separate from all others; and again that the station books of the districts and quarries contain the original vouchers for the whole of the expenditure on the road, except the small amount spent in the purchase of sundries. In the case before us this rule has been forgotten; and it appears to us that a recurrence to it will at once apply the proper check upon the present irregular mode of entertaining and discharging both temporary establishments and monthly labourers, and will place the control and the payment of them under separate authority from that which appoints or dismisses them. Every deputy roadman, and every labourer hired to water trees, &c., is employed in some one road district or other; and every Assistant Cart or Quarry Conacapillay, is employed for some particular quarry. Under the plan now proposed, whenever one or more of any one of these classes are entertained, a note to that effect with date, and rate of pay, should be entered by the Overseer in the station book of the district or the quarry; and a nominal roll of those engaged should be kept at the other end of the book by the Pygust or Conacapillay in charge; the pay would then be disbursed at the end of every month by the Overseer when visiting the station, and would be entered in the station book, as the payments of other sorts of labourers are already. Thus the station books would really become the record of the whole expenditure, except the salaries of the fixed establishment and the small charges for sundries; and at the same time an additional and separate responsibility would be secured, viz., that of the Pygust or Conacapillay. And although it may be said that their standing does not entitle them to much trust; yet there is the improbability that an Overseer would league with one of that class, and thus put himself at his mercy, for sake of the trifling gain to be obtained.

144. As to the receipt book, we have already expressed our opinion that where it is practicable, i.e. where the recipient is present, the receipt should be written in the book; but that from special causes this may be impracticable the separate receipt taken should be pasted at the other end of the book. One thing is essential, viz. that all the receipts should be serially numbered for easy reference; there should be a book for every six months, and it should accompany the bills as a voucher. The separate receipts should carefully be kept as few as possible.

The Receipt book.

There does not appear to be any necessity for a separate book for sundry charges. Whenever articles are purchased a receipt is taken, unless they are very trifling; and this receipt which contains all the particulars, will be found in the receipt book. In debiting the disbursement in the cash book the particulars of the purchase will necessarily be given, with a reference to the receipt; no other record therefore seems necessary.

145. Having done with the detailed books we now come to the cash book. The present form is faulty in some respects. The attempt to show receipts and disbursements at one view, and yet separately, makes the book cumbrous, and at the same time fails of its object. The form is rendered so broad that it cannot be written in the breadth of a foolscap page, and yet as the receipts are in large amounts and few in number, while the disbursements are very numerous, the part of the page appropriated to the former is almost blank, except at the commencement. Another defect is in the mode in which advances are dealt with. It is usual to enter them in a separate column provided for the purpose; and when the transaction is closed the entry is ruled through in red ink, and the whole amount of the disbursement is debited in a new entry. We propose to get rid of the former of these two inconveniences by entering the receipts among the disbursements, as is done in the chitta of daily cash account of a Collector's treasury. This appears the simplest and easiest method; and it will lead almost inevitably to the account being balanced daily; which though now the rule of the department, is not the practice. When both receipts and disbursements occur on the same day, the receipt will be entered last, and the balance then shown; see the form, Appendix H 7. By this method it will always be practicable for the executive officer to examine an Overseer's cash chest at a minute's notice. As to the advances, it is to be observed that this book is a cash book; i.e. a record of cash transactions; those transactions ought therefore to be recorded just as they occur. Now an advance is a disbursement of cash just as much as a settled payment; it ought therefore to be entered in the same column. Again as to the adjustment of advances; not only the obliteration of the advance is very unbusinesslike, but the subsequent debit of the whole amount falsifies the account, for it enters an amount as disbursed on a certain day, when in fact a great part of it was disbursed long before.

The cash book.

The proper and businesslike form of the adjusting entry will be to state the whole amount due, and then after deducting the sums already advanced, to enter the remainder as a debit. In

cases where the advances made are not covered by the value of the materials supplied by the contractor, which will occur occasionally, the mode of entry will be the same, with the difference that the amount recovered will be shown as a recovery. See the specimen book in Appendix H 7.

The abstract of the cash book.

146. In conjunction with the cash book another book should be kept, to be called the abstract of the cash book, exhibiting the expenditure under the various heads under which they are to appear in the bill. Those heads will be opened in the abstract; and whenever any payments are debited in the cash book they should without delay be posted the same day in the abstract under the proper heads. It will also have a column for receipts, in which will be entered all sums received for expenditure, and where they will be shown at one view; and another column for recoveries, in which will be entered all sums recovered out of advances made or on other accounts. At the end of each week the several columns should be totalled. The form for this book will be found in Appendix H 8.

Its use.

This document will very much facilitate the preparation of the bill. At the end of the half year the only thing to be done will be to add the debits of the last fortnight to the previous total in each column, and then transcribe the amounts into the form of a bill. Within two days after the close of the half year the bill may be made out and sent off to the Assistant Superintendent's office with all the vouchers. In order to accomplish this, the Overseer should go the round of all the working stations, as near the close of the half year as possible, and pay the people up to the day of his visit, taking away the station book to be sent as a voucher with the bill. The station book of the following half year to be commenced from that day. An Overseer will certainly be able to visit all the stations in his division within five or six days; and thus the accounts of every station will be closed within two or three days of the end of each half year, before or after.

Other uses.

147. This will be the chief use of the abstract, viz. the punctual preparation and transmission of the bill, but it is not the only one. A second will be that in the journal sent twice a month by each Overseer to the Assistant Superintendent, the actual fortnightly total will be entered, instead of the approximate amount now entered and even that not without some trouble. A third will be that the Assistant Superintendent, or the Overseer himself, will be able, at any time, and almost at a glance, to see what amount has been expended in the half year up to that time under each head.

And if it be objected that this will impose on the Overseer the labour of keeping two books instead of one, it is replied that the trouble will be very small, merely that of entering a few sums in columns already provided. It is not by any means every day that the Overseer has payments to make; and it may safely be said that the abstract will not occupy him on average ten minutes a day, or half an hour on any one day.

The Bridge books.

148. Thus much of the books for ordinary road work. Appendix I 1 to 5 contains forms for the bridge books. The first is for the daily account of labour employed, in the form which appears to us the most convenient, supposing the artisans to be paid on acquittance roll, and the common labourers both male and female by tickets. The latter class are placed at the top, because the number of lines required is in general invariable; if required, however, a few more may be added in order to show separately, as in the Palmanair bridge book, the labourers employed helping the bricklayers, and those engaged on the approaches and other earthwork. By placing the list of bricklayers below, room is given to insert additional names where necessary.

The foregoing relates to labour only; No. 2 is the form of an Account Current, similar to those used at the Palmanair bridge between the work and the parties contracting to supply materials.

The daily "report."

149. No. 3 is a statement or "report" to be filled up daily, showing in abstract the quantity of labour employed, of materials, received and of work done, each day; it resembles the "Report" used at the Palmanair bridge, with the omission of some particulars already given in the statement of labour, (No. 1,) and of others which involve calculation, and could not be readily entered; and which after all do not seem to be required. Besides these three accounts there will be one for the small sundry expenditure on account of the bridge, for small articles such as pots, baskets, ropes, &c.: all these accounts will be in one and the same book. There will also be a receipt book, at one end of which will be written the receipts taken from parties present as well as the agreements with contractors, duly signed by them; at the other end will be pasted such few loose receipts or other papers as may be found to be unavoidable. All should be carefully numbered for reference in the entry in the cash book.

150. Whenever an Overseer supervising the construction of one or more bridges has charge also of a division of road, as will generally be the case, it will be necessary for the sake of clearness, and to avoid confusion and waste of time in making up the bill, to mention in the entry in the cash book, for what particular work each payment is made; viz. whether for the road work generally, or for the bridge and for which bridge, for the establishment, or for sundries: in the specimen cash book in Appendix H 7, it is shown how this should be done. For ease and expedition in preparing the bill there should be an abstract of the expenditure on each bridge of any considerable size; but for tunnels and small bridges it is not necessary to show the outlay on each one distinct. These bridge abstracts will be short and simple, the heads of charge being few; they will rarely occur except in the case of new roads.

When an Overseer has charge of both roads and bridge works.

151. We have already noticed (Paras 120 &c.) the minute detail exhibited in the bills in the Road Department, and the great amount of labour consequently involved in their preparation. The detail is after all utterly useless either to the Government or to any controlling authority. No use is or can be made of the information so tediously elaborated (see para 122) as to how many cart loads of each kind of material are conveyed to each mile, and at what number of trips in the day for each cart; or of the information what quantity of material is spread, or what amount is expended for labour, in each mile or even each six miles of road. These are details which require to be carefully attended to by Executive officer; but they have no proper place in a bill. In no other department have these minutiae of road repairs ever been supplied; and in none we are bold to affirm, has their want ever been felt: and in this department, we may repeat, in which they are furnished, no use is ever made of them.

The bills are now in too much detail.

152. We propose therefore to dispense with all these minute details, and to give the bill in a simple form. For the work done on the 1st Division of No. 1 Trunk Road in the half year above adverted to, there are six bills for work done, as already explained, viz. one for collection or quarrying of material, one for cartage, one for spreading material, one for earth work or general repair, one for sundry labour, and one for sundry charges; and the first four are in minute detail. There are also twelve acquittance rolls, viz. six for the Overseer's own pay, and six for that of his establishment, making in all eighteen bills. Now, putting aside for the present the salary bills, we propose to give the whole contents of the six bills for work, in one single bill, except that we omit a large part of the contents of the bill for Sundries, as we shall notice presently. In Appendix K. will be found the bill for the work, so drawn up. It exhibits the charges in the same classification as the old form of bills; and with exactly the same detail, except that the particulars of the charges for each separate mile of road, and of the material brought from each separate quarry, are not stated. But, as already said, those particulars are totally useless in a bill, and as a fact have never been used there, and the insertion of them involves a vast deal of labour.

A simpler form proposed.

We may add that Appendix H, 9 is the bill for the work comprehended in the other documents in Appendix H, on which we have been remarking. A comparison of those accounts, and especially the Cash book and the Abstract of it, with the bill, will show how exactly and how directly under that system of accounts the bill will be connected with the vouchers supporting it, and how easily and simply it may be tested by them.

153. Under our proposed system great part of the labour and time will be saved, which are now consumed in preparing the bill in the Assistant Superintendent's Office. Except when bridges are under construction, there will be a single bill for all the work done in a Division in each half year. This will be prepared at once by the Overseer direct from the abstract of his cash book, and will be sent immediately to the Assistant Superintendent or other Executive officer of the line, with the cash book and abstract, the station books, and the receipt book. Those documents being duly kept in the form which we have given, it will be simple and easy to compare the bill with them. This will be done by the Executive officer and his establishment; who being relieved from the laborious and complicated work of preparing the bill in the old method, will have ample time for this duty. Being found correct, the bill will then be countersigned by the Executive officer, and forwarded by him to his local superior officer, we will suppose the Inspecting Engineer of the division; who, after ascertaining the correctness of the charges, as regards both the rate of hire the prices of materials, and the quantities of both, will send it up for sanction.

The proposed changes will prevent much loss of time in preparing the bills.

The vouchers should be carefully preserved, as does not appear to be done at present. The office of an Executive officer is too much in motion to form a proper depository, and it seems

The vouchers to be preserved.

unnecessary to collect them all at the Presidency; it will be expedient therefore that they should be lodged in the office of the Inspecting Engineer. That officer should not be required to examine them systematically, or to audit the bills upon them; but it should be his duty to look into them sufficiently to ascertain that they are duly kept, and occasionally to compare a bill in detail with its vouchers.

Some charges improperly entered as "Sundries."

154. But we must advert to the "Sundries" found in the actual bills for the Division of road which we have taken. Among the items entered under that term we find the following: making and repairing iron tools, Rs. 301-10-3; cost of building a hut for the Overseer 80 Rupees; purchase of bandy and a pair of bullocks, 50 Rupees; charge for feeding bullocks 39-1-2, Stationery 27-9. And the total amount of sundries is 595 Rupees. None of the items here enumerated except perhaps the first, had exclusive connection with the work included in the bill; and they might with equal propriety have been entered in the bill for another half year, and some of them for another Division of the road. And the same may be said of many other charges which we have not extracted.

The proper mode of charging them.

155. We do not at all question the propriety of the expenditures here set down among the sundries; but we do object to this mode of charging them, as being far too indefinite, and as affording large scope for the arbitrary adjustment of bills. They are general contingent charges of the department; and as such they ought to be dealt with like the contingent charges of other departments and offices. We recommend that so long as the Road Department remains, all such charges should be collected monthly by the Superintendent from all his subordinates, and after being examined by him should be sent in for Audit sanction.

The cost of tools purchased.

With regard to the charge for the purchase of tools; this does not properly fall among the contingencies, and yet we think that in the case of the ordinary current repair of a road, this also has no proper place in a half yearly bill for work done. We will not however enter into the question here, but will revert to it in discussing the bills generally.

The salaries.

We have already pointed out the irregularity of charging the salaries of the establishment in the bills for work, and have recommended (Para 141) that the charge should be submitted and audited monthly, in the same mode as in other departments. We shall have to recur to the subject in another place.

Concluding remarks.

156. We now close our notice of the Executive system in the Road Department. While there is very much to commend in the general system, we have had to mention various defects in practice. Of the works which we selected quite indiscriminately for examination, it may be said that the Palmanair bridge was an unfavourable specimen of the system, and we believe it was so. The Overseer first in charge of that Division of road neglected to keep any cash book, and the masonry first in charge of the bridge kept his accounts very carelessly. We fully believe that most works executed in the department would show much more care and regularity; but still we do not regret having thus inadvertently taken an unfavourable sample, as it shows the necessity of constant care in the Executive officer, even under the best system. The actual condition of the accounts at this bridge, and that under one of the most active and intelligent Executive officers of the department, shows that more care is necessary in order to ensure that the Overseers shall keep their books accurately and punctually. And there are more indications to the same effect. The variations found between the bills and the Station books, trifling though they are, raise a doubt whether the latter which are in reality the sole vouchers for the charges, are thoroughly examined in the Assistant Superintendent's Office. The laborious detail necessary under the existing system to the preparation of the bill, no doubt consumes much of the time of a small establishment, and the comparison may on that account have been imperfectly made; our proposed changes will remove this cause of neglect.

The best forms and system of account will be useless without exactness and punctuality in those who keep the accounts; and we think it should be the regular practice of the Executive officers whenever they meet any one of their Overseers, both to examine his cash chest, and also to satisfy themselves that his cash book and the abstract are in proper form, and complete up to that day.

SECTION III.

ON THE EXECUTIVE SYSTEM OF THE REVENUE OR MARAMUT DEPARTMENT.

PART I.—A DESCRIPTION OF THE SYSTEM; ILLUSTRATED BY AN EXAMINATION OF THE ACTUAL ACCOUNTS OF CERTAIN WORKS.

157. In an early part of our first report we gave a brief outline of the system of executing work in the Maramut Department; but in order to introduce the changes which we have to propose, it is necessary that we should now describe it more circumstantially. We found that it would be impossible within any reasonable time, if at all, to obtain a satisfactory idea of the practical working of the system by correspondence only; and the means which we adopted were as follows. From the three Districts nearest to Madras, viz. Chingleput, and North and South Arcot, we procured the attendance of five Talook Maramut Gomastahs, as well as of the Head Gomastah of the Collector's office of the first named district, and examined them at length on the practical details of the system. From six other districts, viz. Bellary, Cuddapah and Guntur in the North, and Tanjore, Salem and Tinnevely in the South, we obtained the actual accounts of the execution of individual works, viz. of one from each district, selected by ourselves with reference to their description and amount, by inspection of the bills lodged in the office of the Board of Revenue.

Sources of information as to this department.

158. These accounts were in many cases defective and confused; but we conceive that they may be taken as fair specimens of the executive system in the districts to which they respectively belong, especially chosen as they were indiscriminately. And the system in those districts may also we believe be taken in the general to represent fairly the system in all. Among the six collectorates from which we have accounts, four may be regarded as very favourable specimens of the general practice. Both in Guntur and in Tinnevely peculiar care has been devoted for years past to the improvement of the accounts and of the executive practice; in Tanjore the maramut has always of necessity engaged a very large share of the Collector's attention, and able Engineers have always been carefully selected for that district; and in Bellary the late Principal Collector Mr. Robertson devoted himself for many years to the work of improving the maramut, and it is a district in which the whole of the accounts are commonly regarded as being very good. We know not where we could expect to find matters in so good a state as in these four districts, except it be in Madura and in Canara. On the other hand, though the state of affairs found in Salem is worse than the average, yet there are certainly several districts, we may instance the Northern Circars and perhaps Nellore, in which we should expect to find things still worse. On the whole therefore we confidently believe that the instances taken afford rather a favourable sample than the reverse of the existing system. We now proceed to draw out from the foregoing documents, as well as from the replies of the Collectors and Civil Engineers to our early queries, as complete and minute a view as we can, of the executive system in the Maramut department.

Their value.

159. We will first speak of the small repairs and improvements to irrigation works, whether in earth, rough stone, or masonry. As soon as a Tahsildar receives orders to execute such a work, and has the necessary funds placed at his disposal, he sends to the headmen of the village, desiring that they and the Curnum will come to the Catcherry, bringing with them workmen to undertake the work. This order is either sent verbally by a peon, or more commonly is a written document. The village may be ten, twenty, or even thirty miles distant, for so extensive are

The practice as to small repairs to works of irrigation.

many of the talooks; but in due time the village officers present themselves at the Catcherry, with the work people to undertake the work, and perhaps with a number of the principal ryots or meerasdars. The terms of the estimate, viz. the nature of the work to be done, and the rates allowed for doing it, are then explained to the parties, and the terms having been agreed to, written engagements and security bonds are executed, and a portion of the amount of the estimate is advanced. As to the parties to these proceedings the custom varies in the several districts. In some, the work people themselves, through their headmen, receive the advance and execute the agreement, while the heads of the village give security for the fulfilment of the terms: in others, the heads of the village receive the advance and execute the agreement, and the principal ryots or meerasdars are the sureties. The purport of the documents is the same in all cases: in the "agreement" the parties bind themselves to execute the work efficiently, at the rates set down in the estimate, and within a certain specified time: the sureties engage that this agreement shall be punctually fulfilled. The rate fixed in the estimate is almost invariably taken as the basis of the engagements: it seldom or never happens that a lower rate is agreed upon, but in rare instances the Tahsildar represents that the rate allowed is too low. In general however either the work people or the village authorities are made to agree to do the work at the estimate rates.

Delays and their causes.

160. After these preliminaries have been completed, the people return to their village; in those districts where the maistries are sufficiently numerous, the talook maistry also proceeds to the village to show how the work is to be executed; elsewhere the village people are left without such aid and guidance. In the course of time, though generally not without considerable delay, the work is commenced; but it does not advance very rapidly. The advance has been received, but the parties are by no means in a hurry to perform their engagement. If the work people have received the money, they are likely to engage in other work for private persons: if it has been received by the village officers, they are prone to disburse it at a very niggardly rate to the workmen, or to pay them in grain at their own price instead of in cash, or even to withhold the money entirely; and lay it out for their own benefit. Or perhaps, and this probably not unfrequently, the village heads are people of little intelligence or activity, and the work is new to them; they do not know how to set about it and they shrink from the unknown risks and responsibilities which they imagine to belong to it. The excessive delays which take place, in the execution of work seem to show conclusively that under the existing system there is no sufficient agency for controlling the proceedings. In point of fact there is very little efficient control. The Tahsildar has so many matters to attend to that he can give but a small share of attention to the Maramut; and in particular the annual settlement and the measures preliminary to it, and immediately after that the proceedings necessary for realizing the revenue, engage him during the whole of the best season for working. The maistry, it is true, visits the work from time to time: but from the extent of his charge often two or three talooks, and perhaps some larger work requiring much of his time, his visits must necessarily be at long intervals. And even when he does visit a work he has very little influence, and no power to alter any arrangements; he can only note in his diary that the work is not begun, or is at a stand.*

Defective means of preventing them.

161. Under the most effective administration this remark is noticed by the Collector in fifteen or twenty days; takeed after takeed issues to the Tahsildar to hasten the work, and is repeated by the latter officer to the village heads, and ultimately probably the latter officers are sent for and fined for their remissness. But still the same thing goes on; because, of all the several causes which produce the ill result, the punishment of the monigars deals with only one, viz. the neglect or malversation of those parties, and that imperfectly, for they justly look on their punishment as in some degree their ill fortune. While the other and more powerful causes, viz. entrusting the work to inexperienced and incompetent hands, and the entire absence of any thing like efficient oversight, remain unaffected. Every year not a few works of those ordered remain uncommenced; the remainder proceed slowly, and in the course of time the first advance is worked out. The village officers then apply for a second; and the tahsildar, the peishcar, or some other Talook revenue officer, sometimes accompanied by the Talook maistry, goes and measures the work

* The Civil Engineer or a Surveyor also occasionally visits a work in progress; but of the whole number under execution but very few can be so seen by them, and those are generally and very properly, of the larger class, of which we are not now speaking.

done, and if this is sufficient a second advance is given, and the work proceeds as before. Towards the end of the season more expedition is often used, but still a considerable proportion of the works commenced remain unfinished, and others are not completed till too late in the season. The finished works are measured, though often not for a long time after completion, by the talook officers; the curnum then goes to the talook catcherry with his accounts of the execution of the work, and from these in comparison with the estimate and the measurement statement, the abstract account of the cost is prepared, to be sent to the Collector. The mode of doing this and making out the bill will be explained presently. The village monigars or heads, the people engaged on the work or their headmen, and often the meerasdars or some of them, are then sent for; and they sign the accounts, which are then despatched to the Collector.

162. In the case of works left incomplete at the end of the calendar year, the work done is measured and dealt with in the manner just described, and the remainder is entered in a fresh estimate for the ensuing year: or if the proportion of work done is small, the whole work is entered as not begun, and the accounts remain unadjusted; the whole estimate being carried on to the following year.

After the accounts have been made up and signed, the balance due to the work people, if any, is paid in some districts, immediately; but in others it is retained unpaid until after the work shall have been inspected by the Civil Engineer's department, and if then any retrenchment is made, the amount is deducted from the balance payable to the work people, without any careful pains that the mulet falls on the right individuals.

Balance due to the work people when paid.

163. The foregoing description applies to those works which are entirely entrusted to the village authorities, viz. to all tank and channel repairs not exceeding 1,000 or 1,500 Rupees. In the case of works of larger amount, and even of masonry works and road work of much less amount, a peon or duffadar is stationed on the work to hasten it forward; and in works of somewhat greater magnitude, a talook gomastah or other official is employed to keep the daily accounts, and a maistry is specially deputed to direct the operations. Even in these cases however the village officers are often the medium of obtaining materials, in the mode above detailed; though sometimes the Tahsildar makes direct engagements with parties for their supply. In either case the same system of advances, written engagements, and security bonds, is employed, and there is often much delay and inconvenience from the non-fulfilment of the engagements made. The parties contracting to supply are rarely men of any capital, and generally are little above common labourers, and they are under the same temptation as the other classes above spoken of to misapply the advance and neglect their engagements.

Works of a larger class.

164. Having given this general sketch of the executive system under the Tahsildars, we will now explain the system of accounts in use for the more considerable works, i.e. for those whereon daily accounts are required to be kept, or are made of importance. In doing this we shall go through the accounts procured as above explained from six of the Collectorates and shall then make a few general remarks upon them. All the works in question were of considerable magnitude, and none of them are within the category of those which in most districts virtually, and in some avowedly, are done on contract by the villagers at the estimate rates.

The detailed accounts of works.

165. We will first take the accounts obtained from Tinnevely, because they are the most complete and regular of all those that we received. The work selected was the erection of a Sea Custom House and Master Attendant's office at Tuticorin, the amount of the estimate was Rupees 2,330-8-0, and it received the sanction of Government on the 23rd February 1848. The work was commenced on the 5th of the following September, and was completed in May 1849; the amount of the bill was Rupees 2,338-10-0. The execution of the work was superintended by a maistry temporarily employed for the purpose, and the accounts were kept by a subordinate Tamil writer of the tahsildar's catcherry: they were kept in the Tamil language, and upon cadjan or palmira leaf. Although these accounts are more voluminous than necessary, and are in a confused form, or rather absence of form, yet they appear to contain all the necessary particulars. They are also complete, and so far as they may be regarded as genuine, they afford the means of testing the correctness of the bill. The daily accounts contain the names of all the workmen employed each day, and every day the names are repeated. They show the number of men employed on each part of the work, and the amount of the day's hire of each individual; as well as the materials received each day, and their price, and generally the name of the party from whom received.

The accounts of Tinnevely.

At the end of each month an abstract of the daily accounts was prepared, also on cadjans; and after the work was completed a general abstract was drawn up from these latter, and on the same material. All these accounts are in the roll of cadjan, which may thus be said to be a complete account of the work. Copies of the monthly and general abstracts were sent on paper to the Tahsildar, and ultimately to the Collector. The defects in these accounts are bad arrangement and bulkiness, and consequent confusion. They appear to have been kept with care, and to be complete; and even the defects noticed are found in them in a less degree than in other districts.

The accounts of Tanjore.

166. The next accounts which we will notice are those received from Tanjore. The work chosen was the construction of a causeway across a jungle stream on the road from Negapatam to Trichinopoly. The amount of the estimate was Rupees 3,161-6-0; the work was sanctioned on the 8th Nov. 1845; it was commenced on the 9th February 1846, and completed on the 1st July of the same year.* The amount of the cost according to the abstract of the detailed accounts was Rupees 3,043-8-6½; that of the measurement is Rupees 3,041-7-2, with which the bill is made to correspond, being Rupees 3,041-7-0. The accounts were kept by a nauttoo eurnum, or district accountant, and there was a daloyet or collector's peon to direct the work.

These accounts like those of Tinnevely are written on cadjan, and they form an enormous bundle. The number of leaves is 1,474; the bundle is twenty-two inches in girth, and thirty-nine inches long, being the length of the leaves. It was brought to Madras by a cooly, the Collector being properly unwilling to encumber the tappal runners with such a burden; though its weight is not more than ten pounds, its size is quite enough to make it a man's load.

They are very voluminous.

167. The daily accounts are very voluminous; they contain the particulars of the work done and materials received each day, with the price of the materials, and from whom received; as well as the number of workmen employed, their rates of hire, and the particular work on which employed, with the names of all in some few cases, but in most those of the heads of gangs only. The form is confused and hence there are needless repetitions; and the details of workmen and of materials are all mixed up together. Progress reports were sent to the Collector's cutcherry every fortnight, giving full details of the progress of the work. There is also a general abstract of the whole cost of the work. The roll of cadjans contains likewise 349 receipts taken from the work people for money paid to them; and there are a number of other accounts of various kinds, viz. of payments to the people employed, of recoveries of overpayments, &c.

And very confused and difficult to understand.

Altogether the accounts of this single work form such an enormous body of confused figures, that even to understand it is a work of very great difficulty; and to examine and test the account, so as to ascertain whether the whole and the parts agree, must be a work of much labour and time; and probably would be quite impracticable without the assistance of the persons who prepared them. The Collector appears to have been well aware of this; and he obligingly caused four explanatory statements to be prepared for us, with the view of showing the bearing of the several parts of these accounts on each other. These statements themselves are lengthy documents, and must have occupied no little time and labour in the preparation, and still they fail to explain all particulars.

Explanatory statements A. & B.

168. The first of these statements, marked A, professes to show in abstract the particulars of the actual expenditure agreeably to the daily accounts. It is a long statement with a number of columns, and occupies paper equal to two and a half sheets demy. It first gives an abstract of the work done each day under the original estimate; next it gives the details of some work done in pursuance of the original design, but not specially provided for in the estimate, because in this case as in so many others, it was found expedient at the time of doing the work, to vary slightly from the exact course laid down in the estimate; and lastly, it gives the particulars of the work done under a small supplemental estimate, for turning the course of the stream while the work was in progress. These two latter parts of the paper are without daily particulars.

The second statement marked B, is an abstract of the various accounts received from the Tahsildar. First is the abstract of the fortnightly progress reports, amounting to Rs. 3,043-8-6½;

* An estimate had been previously sanctioned for a bridge, to be built of stone from the Vallum Fort; and much of that material had been brought to the spot, before the design was formed for having a Causeway instead of a bridge. That stone served for the revetment of the Causeway; and this is the reason why the execution of the work was so expeditious.

next is the account according to the measurement of work, amounting to Rs. 3,041-7-11; and thirdly is the bill prepared in the Collector's cutcherry, and agreeing in amount with the measurement, being Rs. 3,041-7-0. Lastly is an explanation of the discrepancies between the Tahsildar's bill and that prepared in the Collector's office, shewing how various items were transferred in the latter from one head to another, and how an amount agreeing with the measurement is at last brought out.

169. Statement C shows the particulars of the charges. It gives particulars for each item entered in the bill, but it is not apparent from what source these are obtained. Thus for the first item in the bill, viz. constructing a causeway, the following particulars appear. Statements C & D.

	Rs.	As.	P.
Vellum stones, 23,236 cubic feet	745	10	3
Chunam	283	8	8
Hire for Bricklayers	289	8	0
Do. for chunam beaters, &c.	60	14	2
Do. for bringing the stones to the site of the work	74	11	4
Do. for bringing gravel and breaking up stone and mixing with chunam for foundation work	20	3	9
Constructing a shed east of the causeway on contract; cubic feet 1751,	145	4	0
	1,619	12	2

Now it does not anywhere appear from what accounts these particulars are taken, except the first two items, which might be got from the first part of Statement A. But even here there are discrepancies; in Statement A, the quantity of Vellum stones is given at 19088 $\frac{1}{5}$ Cubic feet whereas in the bill it is given as 23,236 Cubic feet, the price charged being the same in both cases, viz. Rs. 745-10-3. The cause of this is not explained. Again, in Statement A, the cost of chunam is given as Rs. 44-9-0 in 1845, and Rs. 283-8-0 in 1846, total Rs. 328-1-0: but in Statement C, only the latter sum, viz. Rs. 283-8-0 is found, and it does not appear where the remainder Rs. 44-9-0 is entered. As respects all the other items, as already said, there is nothing in the bundle of accounts to indicate how they were obtained.

Statement D is an abstract of the receipts and disbursements on account of the work. In the concluding part of it are entered several recoveries of overpayments; but there is no explanation on what account the overpayments were made, or how they were recovered, so that there is no possibility of testing them by comparison with the entries of disbursements.

170. Thus even these explanatory statements, prepared undoubtedly with much care, fail to give a clear insight into the accounts of the work. Neither is it apparent upon what information they were drawn up; though they seem to have been compiled not from the original daily accounts but from some abstracts prepared in the talook cutcherry with reference to the particulars given in the cadjan accounts, but after various calculations, alterations, and transfers, to make the items correspond. And even supposing the total amounts to agree, still the adjustments of the items must be arbitrary, because the original accounts do not contain the necessary subdivisions. No one of these particulars admits of being tested, therefore, without a complete examination of the whole body of accounts; and this operation as already said, from the large mass of material, as well as from its confused character, must at the best be an undertaking difficult and tedious in the extreme, if not absolutely impracticable.

Even these elaborate Statements do not make the accounts clear.

171. The next work is the building of a Talook Cutcherry at Condaveed in the Guntoor district. The estimate for this to the amount of Rs. 1,695-14-9, was sanctioned by Government on the 26th August 1848. The work was commenced on the 6th December following, and appears to have been completed about the 19th December 1849, at a cost of Rs. 1,679-8-11; but the roof having been badly done, was rebuilt, and of the Rs. 33-13-2 expended on this, Rs. 17-7-4, being in excess of the original estimate, was recovered from the parties who had superintended the work.

The accounts of Guntoor.

In our former Report we mentioned that much pains had been devoted to the daily accounts in the Guntoor district, with the view of rendering them an efficient security against fraud. The

accounts have thus been rendered extremely voluminous, but it is much to be doubted whether any great addition of effective control has been secured.

The daily accounts are in minute detail.

172. The daily accounts of the work now before us are complete, without any omission. They are written according to the practice of the district, in books, every page of which is numbered serially, and sealed with the Collector's seal. Closely written they fill four books, the number of pages occupied being 467. The books are ruled in columns. The names of all the workmen employed are for the most part entered and repeated every day, and the particular nature of the work on which each man is employed is also noted. The particulars of materials purchased, with their price and the name of the seller, are also given. Whenever money is paid either for materials or to labourers, the mark of the recipient (for none can write) is taken in the book, and the signatures or marks of witnesses are added in another column. These marks are entered opposite the account of each day, as though the hire was paid daily; but it does not appear from the Collector's letter that such is the custom of the district, and the date of payment is not shown. In many instances the marks of the recipients and witnesses are wholly wanting; and where this is the case, there is no voucher at all for the payment or any thing to show that it was made. In the first three of the four books of daily accounts, the expenditure of each day is shown; the fourth book gives for every day, in addition, the amount of the balance of cash in hand, with a list of the coins composing it. Besides the daily accounts contained in the books, there is a second copy on 244 separate papers, being the extract or copy of the daily account entered in the book, despatched at the close of the same day to the Collector.

But are confused and intricate.

173. These accounts like those previously noticed are complicated in various ways; the hire of workmen, of all kinds, and the receipt of materials, are all mixed up together; there are many transfer entries, that is transfers of sums from one account to another, which are in many cases unintelligible, and which cause very great confusion; when any sum is recovered from any parties, it is credited in diminution of the expenditure on that day, though referring of course to totally distinct transactions; and lastly in many places advances of money to certain parties are entered, but the object of the advance is not shown. Thus, with all the multitude of details given in these accounts, yet (like those of Tanjore) they are a mere mass of confusion from the want of skilful arrangement. Without the aid of the gomastah who wrote the accounts to explain them, and then a careful examination of the whole, it is impossible to gather precisely from the accounts as they are, even what was the total expenditure on the work. Practically such accounts are of no more use as affording the means of check than no record at all, because they cannot be examined. They act indeed as a blind, by presenting the appearance of great minuteness and accuracy.

The abstract Statements, and the mode of preparing the bill.

174. There are no monthly abstracts of the daily accounts, but there is a yearly abstract for each of the two years 1849 and 1850. Among the papers received from the Collector are office memoranda called averjahs showing the amount expended every day of the month on each item of the work, which appear to have been prepared as a step to the formation of the annual abstract. These averjahs are not less confused and unintelligible than the daily accounts; they are in no regular form and contain no totals, neither is it apparent when they were prepared, but probably after the work was done and when the bill was about to be made out. The yearly abstracts show a variety of details: that for 1849, closely written, occupies twelve pages of large paper; the other occupies eight such pages. From these two accounts so furnished by the Tahsildar, the Collector's cutcherry prepared an averjah or abstract more confused and unintelligible than even the averjahs received from the talooks. From this abstract four statements were again prepared, showing the cost of the work; in these the quantity of materials is compared with the estimate, and the particulars are shown in various ways, making the total cost in all to agree. One of these four statements forms the bill for the work. In short the accounts are so confused and so voluminous that any effective examination of them may be pronounced practically impossible: for the most skilful accountant could not understand them without the aid of the parties who prepared them, and even then the examination would be a work of very great time and labour.

The accounts of Bellary.

175. The work which we selected in Bellary district was the improvement or construction of a part of the road from Bellary to Dharwar. The work lay in four Talooks of the district, and four separate estimates were consequently made, and the work was executed in four distinct portions by the respective Talook authorities. Of these four Talooks the accounts of the work

in three are extremely defective; the cause alleged being that a great part of the accounts have been destroyed by rain or white ants, although the transactions to which they refer are still so recent. The accounts of the Bellary talook, in which alone one half of the work lay, are less incomplete, and we shall therefore confine our remarks to them. The estimate for the work in that talook amounted to Rupees 5,453-10-0, including a supplementary estimate to the amount of Rs. 465-8-0. The main estimate received sanction on the 13th June 1843; the work was commenced in the following month, and was completed in December 1844; the bill was sent by the Collector to the Civil Engineer on the 15th August, 1846. The amount of the bill is exactly the same as that of the estimate; a sum of Rs. 6-4-0, expenditure beyond the estimate according to the talook accounts, having been struck off.

176. The daily accounts sent up for this work are extremely meagre. The greater part of the outlay having been for earth or rough stone done by the piece, almost the whole of the entries are for advances to the heads of gangs of workmen, with trifling sums entered here and there for the purchase of tools and small articles. The advances are entered with no detail beyond the distinction "Earthwork" or "Bringing stones." This account contains advances for the purchase of materials, but not the adjustment of the advances: nor does it show any thing as to the cost of labour for the tunnels and small bridges on the road. There is a statement purporting to give those particulars; but it is not apparent from what materials that statement was prepared, as the particulars are not found in the daily account. This latter document is in short nothing more than a cash account of sums disbursed for the work, with very little detail as to the object of the disbursement. In some places however it improperly includes among the expenses sums due to work people, or to be paid to them thereafter. It is doubtful whether this is the real original chittah; it seems to be a copy from other rough papers.

The daily accounts are very meagre.

177. Next to the chittah or daily account, are monthly accounts of various kinds, and shewing the particulars of the work performed, in various ways. The principal of these documents are three, as follows; the first gives the receipts and disbursements according to the chittah, and also the quantity of work done by each gang, the outlay for purchase of materials, &c. and the balance outstanding against each head of a gang. The 2d shows in detail the measurement of work executed with the names of the work people; and the 3d shows the quantity of work performed by each head of a gang. There are other accounts of expenditure for ramming the road, for the purchase of materials, and for labour employed in building tunnels, &c. Thus the monthly accounts are full of detail, but it is not apparent from what original papers they are drawn up; no part but that which gives the receipts and disbursements could be obtained from the chittah accounts, and none of the papers sent to us contain the materials for the remainder of these monthly accounts.

The monthly abstracts.

178. The work for which accounts were procured from the Cuddapah district was the enlargement of the Collector's cutcherry on an estimate to the amount of Rs. 2,310-4-0. This estimate was sanctioned by Government on the 12th September 1848; the work was commenced on the 26th December following, and was completed on the 15th January 1850; and the bill was sent up to the Board of Revenue in October 1850. Its amount was Rs. 2,188-2-9.

The daily chittah of this work is an account of the sums disbursed each day for materials and labour, but it gives too little detail and is too confused to serve much purpose. Towards the conclusion it contains many indefinite charges, and recoveries from parties who had received advances; but without detail as to the particulars; so that it is impossible to bring the total to any certain test of examination.

The chengoly chittah is the daily account of the workmen employed, and of the hire due to them, but not of the amounts paid: it also shows the quantities of materials received from day to day, but not their price. The names of all the workmen at work each day are given in this account, and are repeated daily. There is also an abstract of this, prepared every six or eight days when the coolies were to receive payment. In these abstracts the names of all the labourers employed, the number of days they have worked, and the amount due to each, are entered, and also the amount actually paid to each. In some instances the sum set down as due to an individual is not paid, in consequence of his absence or other cause; in such cases it does not appear when the amount was actually paid to him. The payments here entered do not correspond however with the amounts entered in the fortnightly progress reports, which appear to contain not the actual payments of the fortnight, but the amount earned by the labourers.

The accounts of Cuddapah.

The prices of the materials are not shown.

179. There are no accounts showing the price of materials purchased from time to time. The quantities received are entered as already said in the chengoly chittah, and undoubtedly the price ought to have been given there too; this omission having been pointed out by us to the Collector, he informed us in reply that the Tahsildar stated that the accounts containing that information had been lost. So also there are no abstracts of the daily accounts from which alone the fortnightly statements could have been prepared; the abstract accounts from which the bill must have been compiled are also wanting, and are stated to have been given to the Civil Engineer and not returned. An abstract was however prepared for us by the Collector from the fortnightly accounts. This agrees in the total with the Tahsildar's final account, though there are some trifling variations in details.

There are also 78 receipts given by persons who supplied materials; but none for the amount paid to labourers. The whole bundle of accounts is very voluminous, as we shall have occasion to notice presently.

The accounts of Salem.

180. The work for which we obtained accounts from Salem was a bridge over the Chin-naur river. The first estimate for this amounted to Rs. 1,004-11-6, and was sanctioned on the 3rd September 1844. The work was commenced on the 5th December 1844, and completed in May 1846, at a cost of Rs. 971-8-0; but the arch having been carried away by the heavy floods of that year, a second estimate to the amount of Rupees 697 was framed for rebuilding it, and was sanctioned on the 30th October 1846. This work was completed on the 26th May 1849. The two estimates amounted to Rs. 1,701-11-6; the expenditure was Rs. 1,874-2-6 being an excess of Rs. 172-7-0.

Very irregular and incomplete.

181. The accounts of this work are very irregular and very incomplete. There are two books and six loose papers purporting to show the receipts and disbursements on account of the work, but they are very defective. The first few pages of one of the books for a few months are written in the form of a chittah but after that there are no regular systematic entries, but only here and there an item of the receipt of materials, hastily and briefly entered, more like a note to aid the memory than an official record. But even these accounts, very imperfect as they are, are found for the years 1845 and 1846 only; for the years 1847, 48, and 49, during which the bridge was rebuilt, there are none at all.

There are also daily lists of the workmen employed, with abstracts similar to those in Cuddapah for every six or eight days, to show the amount due to each man when they were to be paid. Even these accounts are not complete, nor would it be an easy thing to examine or compare them. We nowhere find any particulars of the prices of the materials. The documents sent to us by the Collector as the engagements of the suppliers, are not engagements but only security bonds, and we learned from him that in fact no engagements were taken. Those security bonds, do not contain the prices of the materials, nor do the receipts taken from the suppliers for advances made to them.

The yearly abstracts.

182. The only accounts which contain full detail are the annual accounts. These are accounts of the measurement of the work, taken at the close of each of the five years in which the work was in progress; but they contain also the prices of materials and the hire paid to the labourers. There are however no abstracts or averjals from which these latter particulars could have been compiled; and in the absence of such, and in the very defective condition of the chittahs which profess to be the original record of the prices of materials, it is difficult to say from what documents these annual accounts were prepared; and of course it is impossible to compare them with any vouchers or original materials. Even in these accounts the meaning of the entries is in some places unintelligible.

From these accounts a closing account was prepared, being an abstract of the five yearly accounts, showing the whole expenditure on the work at one view: and from this last the bill was prepared. The abstract shows the loss sustained on each description of material by the fall of the arch in May 1846; but there is nothing to show how these amounts were determined. The annual accounts, the closing account, and the abstract, are found on examination to tally with each other; as no doubt they would, having been prepared one from another. But the materials on which they all rest are wholly wanting.

Remarks on the foregoing accounts.

183. We will conclude this notice of these six sets of accounts with a few general remarks. Of the whole number, those from Tinnevelly are certainly the best. Although the daily accounts

are encumbered with repetition, and are not in the best form, yet they appear to be complete, and to contain all items of expenditure, though only to be found after laborious search. Averjals or accounts showing separately the expenditure for each particular, would much assist the examination of these accounts, but such are wanting. In Tanjore the daily accounts have also been on the whole carefully kept, and though very voluminous, they contain the details of each work distinct from others. The chief source of confusion is that the whole expenditure of each day is not exhibited. The Guntoor accounts come next, even if they might not be placed before those from Tanjore. They exhibit more appearance of system than either of the preceding, and the daily accounts are full, but in a very bulky and complicated form. These accounts also are accompanied by averjals, which are of some use as a guide to understand them. In Bellary the particulars of expenditure are scattered and confused, and they are not complete; still there is some regular account. The Cuddapah accounts are both very incomplete and complicated. Those of Salem are worst of all. The original or daily accounts hardly afford any useful information; and they cannot have been of much service in preparing the bill.

184. The chief faults common in a greater or less degree to all these accounts are their enormous bulk and their extreme want of perspicuity. Their very bulk is quite enough to prevent their being generally scrutinized very closely. Thus the bundle of accounts and papers received from Cuddapah for a work costing a little more than 2,000 Rupees, was equal to about twenty quires of paper as large as demy. Those from Bellary, for a road work to the amount of 5,000 Rupees, were equal to about seven quires, and yet some essential particulars wanting in them; and those from Guntoor, for a work costing 1,700 Rupees to fourteen quires; the Tanjore accounts are still more bulky. Simply to examine any one of these sets of accounts, to make the calculations and ascertain their correctness, would take one man several months: we compute that these operations would take one gomastah about three months in the case of Cuddapah, two months in the case of Bellary, three in the case of Guntoor, and four in that of Tanjore. Let it be remembered that in each case this is only one work out of many; and remembering also that the maramut department of the Collector's office seldom contains more than two gomastahs, and that there is very much more work to be done besides the examination of the accounts of work executed, it may then be judged how far these accounts are ever really examined at all. The Collector of Tinnevely indeed informs us in his reply of the 26th May, 1851, to our circular queries, (Que. 7), that the daily accounts of works are not often scrutinized. If the charges do not exceed the authorized rates, he says, no inquiry is called for. He adds that such inspection takes place when specific complaints of fraud are brought, and apparently then only; and in the preceding reply he had mentioned that a case was then under enquiry leading to the belief that the daily accounts were "not very faithfully kept." So also the head gomastah of the Chingleput Collector's office in the maramut department, who gave his evidence very freely, declared to us that the accounts received from the talooks are so numerous that there are very many which he is never able to look at. In particular he said that he never looks at the daily accounts kept by the cur-nums of work under execution. He adds that the accounts sent in contain many repetitions, and that many copies are unnecessarily made.

Their enormous bulk makes scrutiny impossible.

185. Nor is the bulk of the accounts now in use the only evil, their confused composition is another and perhaps a greater, for it is even a more serious impediment to their examination. A great variety of particulars are thrown together without arrangement; and from the want of a good system, unnecessary matters are repeated over and over again day after day. To disentangle all this matter, and show any thing like clear results is necessarily a work of much time and difficulty, even to those long conversant with the system, or to the very persons who wrote the accounts. To other persons they may be styled unintelligible; and from the mere fact of their confused arrangement, too detailed in some particulars, much too little so in other and more essential particulars, especially as to the objects of the various expenditures recorded, the ultimate results may be shown variously, according to the will of the person who makes up the accounts, with very little risk of detection.

And they are very confused and intricate.

186. And as regards the voluminous and confused daily accounts, before their purport can be even ascertained, it is necessary to go through the whole, and make out new accounts separating the items under the various heads, a work of great time and labour. For the controlling Officer to take up an account, and be able to judge at once of its contents and test its correctness, that is an impossibility.

The daily accounts are useless for prompt check.

In the Road Department the daily accounts of each road-district, or quarry, or work, are so clearly kept that a person but little acquainted with accounts would have very little difficulty in ascertaining at the cost of a few minutes attention, what amount of labour has been employed there within any given time, what it has cost, and what results of it he ought to find; or what quantity of materials of any kind have been prepared, and ought to be present for inspection, and at what cost. In the maramut department this valuable check is impossible. Most of the Civil Engineers inform us that on visiting works they ask for the daily accounts, but that they are seldom forthcoming; either they have not been kept, or it is not convenient to produce them. Several Engineers, especially Captain Lawford of the 6th Division and Lieutenant Hemery 1st Assistant in the 2d Division and in charge of Cuddapah, express the decided opinion that when they are produced they are often fabricated. Most of these Officers, likewise declare their conviction that the accounts of the cost of works are not truly made up from any daily accounts, but are fabricated to agree with the estimate. On this subject we shall speak presently.

Voluminous and confused accounts are effectual for the purposes of fraud.

187. Accounts when produced are sometimes unintelligible. At the Godavery Anicut, though the work was all superintended by the Civil Engineer's department the accounts were kept by that of the Collector. An accountant from the establishment of the latter Officer was placed under the Civil Engineer, to keep the accounts in forms supplied to him by the Collector's serishtadar; and Colonel Cotton informs us that frequently when he was desirous to learn some matter from the accounts, he was obliged to send away the accountant after two hours of endeavour and give up the attempt as hopeless, finding it impossible to obtain so simple a piece of information as the amount of cash in hand. There is no better or more effective shield for fraud or malversation than voluminous and complicated accounts. They serve the purpose of the rogue far better than having no accounts at all: for in the latter case watchfulness will be awake; and will be disagreeably inquisitive; whereas the exhibition of a large array of figures has a powerful influence in lulling watchfulness and suspicion to sleep. It is not that the controlling officer ever attempts to examine them, their very quantity deters from that; but he cannot resist the impression that where there is so much apparent detail there must be truth. He forgets that accounts may be prepared with much detail on many points, but with very little on some essential particulars; or again that there may be a vast mass of details, but with so little arrangement and classification, and so little exhibition of results, as practically to convey no useful information.

PART II.—EXAMINATION OF THE OPERATION OF THE SYSTEM ON CERTAIN POINTS; THE MODE OF PREPARING THE BILLS, THE PAYMENT OF THE PEOPLE EMPLOYED, THE DELAYS, AND THE BULK OF THE CORRESPONDENCE AND DOCUMENTS.

The mode of preparing the bills.

188. One of our chief objects in calling for accounts of work actually executed, as well as in examining gomastahs from the interior, was to ascertain precisely the mode followed in the maramut department in preparing the bills for work done, the due preparation of which is in truth the main end of keeping any accounts at all. On this important point however we failed to gather very precise or satisfactory information from the accounts which we examined. Obviously the true and proper mode of drawing up the bill for a work, is to frame it from the daily accounts; the sum total of which in fact, just as they stand, ought to form the bill. This is the mode in use in the Military Department and in the Road Department, but it is not the course followed in the Maramut Department. We will endeavour from the best materials at our command, to detail the method actually used in the last mentioned department.

189. In no one of the six sets of accounts before us is it explained, or can we discover exactly, by what precise steps the contents of the bill are determined; but the general course appears to be as follows. For the most part some kind of daily account is kept, though in many cases incomplete and imperfect, and always complicated and confused: in some instances too, monthly abstracts of these are prepared. From these accounts a general abstract is made out, shewing the total expenditure on the work executed, for labour of each description, and for materials of each kind. This abstract is then compared with the measurements of the work, taken either by the Civil Engineer's Department, or if it has not yet been visited by that department, then by Tahsildar or other Revenue officer. In this comparison, as appears from the statements of the gomastahs, if the quantities of materials charged exceed those allowed by the standing data of the district for the measured quantity of work, the excess is arbitrarily struck off; or if the quantity of labour of any kind exceeds that allowed in the data, the surplus is generally struck off: and the same in the case of an excess of prices of materials above those allowed in the established data. In every such case the "data" rate is taken for the bill; but in cases where the rate or quantity charged is below the data rate, the former is retained in the bill. Sometimes in this arbitrary adjustment the quantities found in the abstract of the accounts are retained, but the price is altered; at other times the total sum charged is retained, but the quantities are altered.

The total amount how determined.

190. The total quantities and charge being thus determined, the next thing is to apportion them according to the different items of the estimate; for in the Maramut Department the charge is required to be arranged for all the various items of the estimate, shewing the cost per cubic yard. The general abstract, framed from the daily accounts, exhibits the quantities and the cost of the materials and labour of different kinds expended on the work; but the bill professes to shew the cost of each separate member and portion of the work, exhibited in a totally different form, viz. the various component parts of the cost, the quantities of materials and labour and their price, being compounded together and shewn in the form of the number of cubic yards in the work. This adjustment cannot but be wholly arbitrary and fictitious; simply because the original accounts, from which alone the necessary information could be obtained, do not contain it.

The total how divided.

191. Thus in the case of the Cuddapah Collector's catcherry above noticed, the abstract exhibiting the cost of materials and labour according to the monthly accounts comes to Rs. 2,188-2-9: but the amount of the bill according to the measurement of the work is Rs. 2,500-3-9, including the labour of convicts employed in making bricks, which is valued at Rs. 312-1-0. This latter sum being deducted from the amount of the bill leaves, Rs. 2,188-2-9 which agrees with the talook abstract. The bill for the work consists of four principal Divisions; the Collector's room Rs. 874-15-11, the Head Assistant's room Rs. 752-4-0; the Assistant's room Rs. 752-4-0, and excavating foundation and sundries Rs. 121-11-10, total Rupees 2,500-3-9. Neither the general abstract nor the monthly or daily accounts give the separate cost of even these main divisions of the work, much less of the various subdivisions of foundation and basement, walls, parapet walls, archwork, pillars, cornices, plastering, and terracing, into which each of the first three divisions is distributed in the bill; they show simply, as already said, the quantities of materials and labour, and their price, for the whole work. There is nothing to show on what principles, on what data, or by what calculations, this minute distribution was made; but obviously it was wholly arbitrary. Again with reference to the sum deducted as the value of the convict labour employed; there is nothing in the accounts to show how many bricks were so made, or by what process the value of their labour was ascertained; but it seems probable that the amount of the Civil Engineer's measurement of the work at the data valuation having been taken as the sum of the bill, and the total of the general abstract having been therefrom deducted, the remainder was set down as the value of the convict labour.

An example.

192. In some cases the daily accounts state the particular employment of each workman; and this is the case in the accounts from Tanjore and Tinnevely; and it may be argued that such entries afford a clue to the divisions of the outlay on the several parts of the work. This might be true to some extent (though the subdivision in the daily accounts is not minute enough to do it wholly) if the daily accounts were really used for that purpose, but there is no doubt that they are not. Independently of the fact that the monthly abstracts do not give those particulars, the enormous bulk and the very confused and complicated arrangement of the daily accounts forbid such a use of them generally, from the long time that it would require. But even if the required divi-

This division is arbitrary and not based on the accounts.

sions of the cost of labour could be thus obtained from the daily accounts, which practically it cannot and is not, still the difficulty would remain as respects the materials; for no daily accounts of any district show the distribution of materials to the various parts of a work.

Further notice of the mode of making it.

193. The accounts which we have examined show that this operation of dividing the whole cost among all the different component parts of a work occupies much time and labour; and after all it is utterly useless or worse than useless, because entirely fictitious. In some districts the bill is thus prepared in the Tahsildar's cutcherry; in others the Tahsildar sends up an abstract of the accounts to the Collector's office, and the bill is prepared there. In either case the operation of preparing the bill is a manufacture, and a complicated one. The accounts received from the work are subjected to a variety of processes, so as to bring out results corresponding as nearly as possible with the estimate; and in order to effect this, large sums are without hesitation transferred from one head of charge to another, and amounts are altered over and over again till the object is attained, viz. till the various items in the bill correspond as nearly as may be with the similar items in the estimate; the great object being that the former shall not exceed the latter in any one.

Instance from the Cuddapah Cutcherry.

We may give examples of this mode of proceeding from the accounts before us. In the Cuddapah Cutcherry we find that in the talook abstract and in the abstracts prepared in the Collector's office from the monthly accounts, the total cost of timber for joists, beams, doors, and windows, &c. is Rupees 451-3-6; whereas in the bill the whole of the entries on these accounts amount to only Rupees 404-5-10 and as the total of the abstract and of the bill agree, it is clear that the difference, viz. Rupees 46-3-8 has been transferred to some other item. We may notice another fact found in the bill. In the Tahsildar's bill for the work the amount of that to the Head Assistant's room is stated at Rupees 752-4-0, though the aggregate of all the sums set down as making up that total amount to no more than Rupees 734-1-0. But in the bill prepared in the Collector's office a new item is added among the component items, so as to make their aggregate agree with the total set down, viz. Rs. 752-4-0.

Instance from the Condaveed talook Cutcherry

194. The accounts of the Condaveed Talook Cutcherry in Guntoor district also furnish some examples. This is the district, as already observed, in which there is more pretension to system in the accounts than in any other, and where they are found in more elaborate minuteness than elsewhere. Various processes were gone through in preparing the bill for the work before us. From the detailed and complicated daily accounts an abstract was prepared for each Calendar year during which the work was in hand, viz. for 1849 and 1850. From these two Statements, which contain many details but are far from being clear, one general abstract was compiled, and from the latter some shorter abstracts, which alone contain any useful information as to the cost of materials and labour. From these latter the bill was made out; and it is clear that after all this labour and this show of exactness, that document was not prepared from the accounts of the work, but that the amounts found in those accounts were altered and garbled to agree with the measurement accounts and with the estimate. Thus in one of the short abstracts just spoken of, the whole cost of brickwork in chunam is stated at Rs. 812-6-7; that of flooring at Rs. 105-0-11; that of plastering at Rs. 111-14-0; and that of roofing at Rs. 545-3-3. The paper in which these entries are found makes no reference to the measurement of the work, and was perhaps prepared before that was taken; in another abstract, which gives the details of the measurement, those amounts are all altered. The first is changed from Rs. 812-6-7, to Rs. 856-9-0; the second, from Rs. 105-0-11, to Rs. 70-0-9; the third, from Rs. 111-14-0, to Rs. 122-4-6; and the fourth, from Rs. 545-3-3 to Rs. 525-3-3: and the amounts so altered are those entered in the bill.

Similar methods followed in all districts.

195. We have already shown (Paras 168 &c.) that the same arbitrary mode of preparing the bills obtains in Tanjore. The accounts received from the other districts afford very slender means of ascertaining the exact process by which the bill was arrived at; and of course in the absence of the intermediate accounts, there is less direct evidence of this sort of unreal adjustment, but there seems no doubt that it is systematically practised in all the districts. And in none we believe as we have already said, are the daily accounts really examined in the Collector's Cutcherry; the abstract statements received from the Talook being alone made use of. In Tinnevely this is avowedly the case; and though in Guntoor, the established rule is that they should be so examined, yet even there they are certainly not regarded as the foundation of the bill. Their very bulk and confused form appear effectual obstacles to their being really examined, with the present strength of Establishment. It is a part of the system in Guntoor, as the acting Collector informs

us, that the daily accounts shall be examined in his Cutcherry every day, as received. But we are justified in believing that if any such examination takes place it is very superficial. For to make it of any real benefit averjabs or abstracts of the daily accounts must be made out in the Collector's Cutcherry; but though the documents sent to us comprise abstracts made there of the Tahsildar's monthly accounts, we looked in vain for any such abstracts of the daily accounts.

196. The system of making out the charges, as we have described it, will we believe, be readily admitted to be decidedly bad. At the best it is a tampering with the accounts, which are thus vitiated and deprived of all value as records of the real cost of work, even when all is done honestly and bona fide. Even in this the most favorable view, the bill ceases to be what it ought to be and what it professes to be, a record of actual facts. But the system is objectionable on other grounds than merely irregularity in a mode of dealing with accounts. It makes the standard data lists the only test of the correctness of charges, and yet it is notorious that those lists are very far from having been prepared with care. Many of them were drawn up by the Tahsildars themselves, and though generally parts of them received the approval of the Civil Engineer of the time when they were framed, yet even that was not after actual trial. An instance of the untrustworthiness of these data lists occurred lately in the case of the Anicut on the Cheyaur River in the North Arcot district. The standard price of chunam in the data table of the Trivatoor Talook in which that work is situated, and of most parts of the District, is sixteen parahs for a pagoda; at that rate it has been paid for in all Government works in the talook for many years, and when the anicut was to be commenced, the Tahsildar declared that good chunam could not be obtained at a cheaper rate. This however did not satisfy the Civil Engineer, and on communicating direct with the people who prepare it, he found them quite ready to supply him at the rate of 28 parahs for a pagoda. And ultimately he made engagements with them to lay it down at the work at the rate of 24 parahs; being a saving of 33 per cent, independently of the carriage; and at this rate the whole of the chunam required for all the work was supplied without objection or delay.

Remarks; the data rates.

197. It may be observed indeed that the system on which we are now remarking absolutely requires that the data rates should be high, the maximum instead of the fair average cost. For if all charges above the data rates are to be disallowed, those rates must be as high as the highest probable prices at any time, (including those accidents and contingencies especially of weather, which inevitably must occur in some cases and may in any one,) or else they will be the occasion of injustice, and Government work will only be undertaken on compulsion. It seems clear then that thus to make the data rates the only check on over charge must be a bad system; because under different circumstances the cost of similar work must vary in different localities and on different occasions, while this system brings them all to the test of one common standard. A powerful temptation is thus held out to untruthfulness, and we cannot but entertain strong apprehensions that this is extensively practised. Instances such as that of the Cheyaur Anicut just given (and other similar might be quoted,) strongly indicate that it is so. Again we have already given reasons for believing that the daily accounts of actual expenditure on works are not punctually or faithfully kept, that in short they are not worthy of more credit or confidence than they receive; and it would not be difficult for skilful accountants so to prepare those accounts as to obtain a total nearly approaching the amount of the estimates, as so many of the Civil Engineers believe to be actually done. Where the daily accounts are not sent in till the end of the month or the completion of the work, this operation is evidently easy; and we have a proof that even the practice of sending the daily accounts to the Collector's cutcherry every day, does not prevent such tampering, for the Acting Collector of Guntoor informs us that in that district, where such is the practice, a Subordinate Revenue officer charged with the superintendence of certain annual channel repairs, was recently convicted of having habitually for years past appropriated to his own use two annas in every Rupee, or 12½ per cent, of all the money disbursed for those repairs by the Government.

Temptation to untruthfulness.

198. Such is the mode of determining the charge for a work in the Maramut Department where it is executed immediately under the management of the Revenue officers of Government. The smaller works which are left to the superintendence of the village officers are managed in the same manner, except that the detailed accounts are in general still less cared for in their case. In some districts, as in Madura and Tinnevely, no daily accounts at all are required to be kept or to

The preparation of the bill in small works.

be exhibited for such works; they are given on contract to the village officers at the amount of the estimate, and provided they are properly executed that amount is paid without any inquiry whatever whether the actual cost was more or less. In other districts, perhaps in most, the same practice obtains virtually, though nominally and ostensibly the works are executed by direct agency, and detailed accounts of the expenditure are required; which however being known to be unworthy of trust are entirely disregarded, and are rarely even looked at.

The security that the labourers are properly paid.

199. One of the objects sought in requiring accounts of work as well as in providing superintendence, inspection, and check, is to ensure that the charges shall be just; another object not less important is to secure the work people employed from being defrauded, by ensuring the prompt and full payment of their due. We have described the operation of the Maramut Department as respects the first of these objects, and will now consider it with respect to the second. The mode of paying the people differs somewhat in the several districts; in some they appear to be paid daily, but in general they are paid only every four or five, or every eight or ten days; at which periods the accounts of each man are made up, and either the whole or a part is paid to him. The paying officer is usually either the gomastah or other talook official employed to superintend the work, or some other talook officer specially sent to the work for the purpose, or in rare instances the Tahsildar himself. Invariably, written receipts for the amounts disbursed are taken, from the heads of gangs of workmen in the case of wudders and some other classes, and from the actual workmen in the case of artisans, as well as in that of many classes of common labourers. In Guntoor, as already said, and in other districts also, the receipts bear not only the mark or signature of the recipient, but also that of one or more witnesses. And besides this each workman or each head of a gang, as the case may be, on every work, in Guntoor, is supplied with a book, in which are entered all payments made to him. In Tanjore also a similar practice prevails, the difference being that there each man is furnished not with a little book, but with a palmira leaf, which he keeps himself, and on which the payments made to him are noted.

The small value of receipts taken from them.

200. This and other matters however are points of detail, on which the local practice varies; the general fact is that these receipts and attestations constitute the sole security that the labourers are duly paid, it remains to consider what is the value of that guarantee. Most of the Collectors express the conviction that its value is very small indeed. Some are of opinion that the labourers may be and often are compelled by delays and other means to accept less than they consider their due; others who think that the people would stand out for what they think due to them, declare their conviction that it may be and probably is an understood thing that a certain part of that shall go to Government officers, and also that even those who stick out still more rigidly for their own rights, yet know not and care not what is the purport of the receipts they sign, provided their idea of their own claims is satisfied. Thus even admitting that the receipts are a protection to the work people, they fail to protect the Government. We believe however that they do not protect even the work people; and the fact to which we adverted in our First Report, and which we shall have to notice again, viz, that prompt and full payment by European Overseers, at the same or even lower nominal rates, has often obtained abundant labour, when a Tahsildar has declared himself unable to procure any, appears to us convincing proof that under the Tahsildars the men are not paid fair wages, and that they do not receive the whole amount charged.

Instance in proof of it.

201. For a good illustration of the real value of the acquittance thus taken from the work people, we may appeal to the testimony of Mr. Bush, the intelligent Overseer (now Revenue surveyor) who superintended the execution of the anicut across the Choyaur, and the channels and other works connected with it. Mr. Bush himself kept complete accounts of the works, and every Rupee expended was paid in his presence; but the usual accounts were also kept on the part of the Tahsildar, by a gomastah who was always present at the work. The Overseer did not take acknowledgments from the work people, knowing that they would be worthless from people who could not read or write; but the gomastah was obliged to have such acquittance in his accounts. The people were paid every eight or ten days; the gomastah paid them under the direction of the Overseer, who holding in his hand his roll of names and amounts due, checked off upon it each payment as soon as made. It often happened that 700 or 800 men were paid at once, and this operation occupied from 6 o'clock to 8; had receipts been taken, it would have lasted till midnight or later. Every man, as fast as he was paid went away to his home, and it was there-

fore absolutely impossible for the gomastah to obtain receipts for the payments. Without such vouchers however, his accounts would not have been received by the Tahsildar, and he therefore found it necessary to fabricate them. The Overseer saw him affixing the marks of all the workmen in his nominal roll; and he excused or justified himself, by saying that unless he did so his accounts would not be admitted. This fabrication having thus been certainly committed once, and with so little apparent scruple or shame, may have been so frequently; the thing is excessively simple, and very unlikely to be detected.

202. As regards the efficacy of these receipts in securing the Government, we would again appeal to the case already quoted as having occurred in Guntoor, wherein the superintendent of a species of work consisting entirely of labour, was proved to have systematically embezzled one eighth of all his nominal disbursements, for a series of years. There is no district in which all the checks that accounts and receipts can afford are more painfully employed than in Guntoor; and this case seems to us to show emphatically how small is the value of such checks when standing alone. Nor is that by any means a solitary case. Almost all the Collectors declare their conviction that the servants of their Department from the Tahsildars downwards, systematically embezzle a larger or smaller part of all Maramut monies passing through their hands; some include the servants of the Collector's own office and of the Civil Engineer's Department, and it is difficult to conceive how either can be wholly unstained by a practice so general. Most of the Collectors forbear to offer any opinion as to the rate of this deduction; others declare what they believe to be usual in their districts. Some state it at 10 per cent, others at more; the late Collector of Masulipatam believed that the Tahsildars alone usually got 12½ per cent, and the other talook officers about 5 or 6 per cent among them; the late Government Agent in Kurnool supposed that the Tahsildar's share was 10 per cent, and he gave one instance in which a Tahsildar was proved to have appropriated 71 Rupees, out of 650 Rupees charged as advanced for chunam: the Collector of Rajahmundry states that when he first joined the district the usual rate was 25 per cent but he believes that he has succeeded in reducing it to 6½ per cent, or one anna in the Rupee. The existence of such a practice as this is conclusive proof that the accounts rendered of the work performed are elaborately false; since it is certain that they are so made up as to show the whole amount charged to Government, as disbursed upon the work. This inference appears inevitable; and yet one Collector, while he declares his conviction that the Government servants every where appropriate a per centage of maramut monies, even to the extent of 25 per cent, yet believes that there is no general practice of rendering untruthful accounts of the execution of work.

Their small value in securing the Government from wholesale fraud.

203. The Gentlemen whose testimony we here quote are the heads respectively of the very establishments whose conduct they thus impugn, and therefore not likely to judge unfavorably of their own subordinates, and they are surrounded by persons participating in the offences, or closely allied to those who are; and remembering this, it may safely be assumed that these representations are rather within than beyond the truth. And what then can we think of the efficiency of a system of check, under which such frauds can be habitually practised? And though thus fallacious and useless, how clumsy and cumbrous does this system appear, when contrasted with the simple, easy, and efficient ticket system, as described above in speaking of the road department. And yet, we must add, defective and imperfect in a high degree as we find this system to be, and quite ineffectual to its object as we are justified in styling it, it is far from easy to say what more effectual means could have been devised in its place, under the actual circumstances of the department. Under those circumstances the ticket system would undoubtedly have been a total failure; for obviously that can only be successfully worked when there is a well organized department, and trusty agents never very remote, conditions which are and always have been wholly wanting in the executive department under the Tahsildars. So that here, as in so many other instances we find that the real source of evil is the want of an efficient establishment.

The system entirely fails in that particular.

204. The foregoing description applies to those works which are executed by the immediate agency of the Government Establishments. These comprise every where irrigation works exceeding 1,000 or 1,500 Rupees in amount, and works to roads and buildings down to a very much smaller amount: and in Guntoor all works whatever come under this description, for it is not customary there to execute any work at all through the agency of the village authorities. As respects the security for the people employed on works performed under the superintendence of those authorities, it is sufficient to say that it is undoubtedly smaller than is above described. Little or no

The case of labourers on the smaller works.

interference is exercised by the Government servants. The people employed are generally entirely under the control of the village officers, and are paid by them at their own convenience, and in money or grain as they find most for their interest. Complaints to the Collector are rare, in consequence of the distance; and even when they are made, redress is uncertain from the same and other causes; and in point of fact it may be said that the labourers are almost wholly at the mercy of the village authorities. This does not apply however to bricklayers, who are often procured from a distance by those officers at a cost exceeding what is allowed in the estimate or the bill.

Delays in execution, and preparing the bill.

205. Among the most prominent characteristics of this branch of the Department we thus find voluminous, confused, and untrustworthy accounts, and uncertain, irregular, and defective payment of labourers, combined with embezzlement by the Government Agents. We will now proceed to notice more briefly a few other incidents of the system. The first that we will remark upon is the delay which is almost invariably found. This occurs at every stage, in obtaining sanction for estimates, in executing the work, in making up the accounts, and in sending in the bill.

As the best mode of ascertaining the extent of the delays in practice, we again appealed to actual facts. We took indiscriminately, lists of works performed in various districts, and caused the dates of all the stages of their execution to be affixed in the office of the Board of Revenue in the Public Works Department. Of all these entries we shall here make use of the dates of the estimate, of its sanction by Government, of the completion of the work, of the receipt of the talook accounts or bill in the Collector's office, and of the despatch of the bill from that office to the Civil Engineer. We shall advert to the ulterior stages hereafter. The total number of works in the list is 107, in the following districts, North Arcot, South Arcot, Salem, Trichinopoly, and Guntoor.

Table of delays.

206. The following table exhibits in a compendious form, the information contained in the larger Statement.*

PERIOD.	Under 100 days.	100 to 200	200 to 300	300 to 400	400 to 500	500 to 600	600 to 700	700 to 800	800 to 900	900 to 1000	1000 to 1200	1200 to 1500	1500 to 1700	1700 to 2000	above 2000 days.
From date of sanction to completion of the work.....	3	13	18	15	6	13	10	10	11	4	2	0	2	0	
From completion of work to receipt of talook bill by the Collector.....	47	22	25	8	4	0	0	0	0	0	1	0	0	0	
From receipt of the talook bill by the Collector to the despatch of the bill from his office to the Civil Engineer.....	27	19	23	29	0	3	3	3	0	0	0	0	0	0	
Whole period, from date of sanction to the despatch of the bill by the Collector to the Civil Engineer.....	0	0	0	3	1	9	8	20	11	26	18	8	1	2	

Remarks on the table.

207. We find from this table, that in forty-four out of these 107 works, being 40 per cent of the whole, the length of time from the Government sanction to the completion of the work ranged from 500 to 900 days, or from sixteen months to two and a half years; and that in eight works it exceeded even the longer of those terms. So again, the time occupied after the com-

* The Statement here referred to will be found in Appendix R. It contains there however only 105 works instead of 107; the cause being that in the case of two out of the latter number, the dates of some of the later events could not be obtained.

pletion of the work, in preparing the accounts and the bill in the Talook, exceeded one hundred days in sixty cases out of the whole 107. In 47 cases, being 44 per cent of the whole, the time ranged from 100 days to 300; and in thirteen cases, being 12 per cent of the whole, it exceeded 300 days or ten months.

Again in the remaining stage of those now under notice, viz. the examination of the talook accounts in the Collector's catcherry, and the preparation of the bill for submission to the Board of Revenue through the Civil Engineer, the detention in fifty two cases, being 48 per cent of the whole, ranged from 200 to 400 days, or from nearly seven to above thirteen months; and in nine cases from 500 to 800 days, or from 16 to 26 months.

Looking to the whole time from the sanctioning of the work to the transmission of the bill to the Civil Engineer it is seen that in fifty six cases, being more than half of those in the table, the whole time occupied exceeded 900 days or two and a half years; in eleven cases it exceeded 1,200 days, or three years and four months; and in two cases it exceeded 2000 days or six years.

And yet the great majority of these works were of very moderate amount. Of the whole 107 cases, no fewer than 73, being nearly three fourths, were under 500 Rupees each; and eighty eight were under 1,000 Rupees each. And not only were the works of moderate amount, but by far the greater part of them were of the simplest description, mere repairs to tanks in earth or rough stone work.

208. The causes of this excessive amount of delay, extending even to the most trifling works, are not difficult to assign at each stage of the proceedings; and they resolve themselves, as might be expected, into defects in the executive system and its agents. In describing the system we have already (paras 160 and 161) noticed the delay in the first of the stages included in the Table, that is, in the actual execution of the work. We there pointed out that as regards the very numerous class of works executed through the agency of the village officers, (to which class belong almost all the works included in the Table,) the delay is partly owing to the fraudulent misconduct of the village officials in misappropriating the advances; partly to their ignorance and inaptitude for the work; but chiefly perhaps to the absence of any thing like an effective oversight or control over them, the Tahsildar's department being both incompetent and wholly without the requisite leisure, and the maistries being few, ignorant, and powerless.

The causes of delay in small works.

209. In larger works the delay is usually occasioned by the neglect of the Tahsildar to take the necessary measures to procure materials, by the nonfulfilment of engagements by parties contracting to supply them, by the desertion of workmen, the want of a maistry, or the dilatory modes of proceeding, habitual to the people and not controlled by any vigorous directing agency. For examples of the delay in works of this class we may appeal to the six works to which we have already adverted: the following table gives the dates of the principal events in the course of each of those works.

Delay in works of a larger class.

District.	Nature of the Work.	Amount of Estimate.	Date of Sanction.	Date of commencing work.	Date of completion.	Date of sending accounts to the Collector.	Date of despatch of the bill to the Civil Engineer.
Cuddapah...	Improvement to the Collector's and Head Assistant Collector's Catcherry...	Rs. 2,310	4 0 12th Sept 43	26th Dec 43	Jan'y.	50 4th Sept 50	24th Sept 50
Salem.....	Constructing a bridge over Chennaur in Ossoor Talook	1,004 11 897 0	6 3rd Sept 44	12th Feb. 45	May	49 8th Nov 49	5th Jan'y 51
Bellary.....	Construction of a Road in Bellary Talook	4,983 6 0	12th June 43	12th July 43	10th Jan 45	14th May 45	15th Aug 46
Tanjore.....	Constructing a Causeway across Moodalaymoorty-vauary	2,714 6 450 0	8 8th Nov 45	9th Feby 46	July	46 Decr.	46 15th Feb 49
Guntoor.....	Constructing a Talook Catcherry at Condareed	1,695 14 9	26th Aug 48	6th Dec. 48	13th May 50	17th May 50	24th Sept 50
Tinnevely...	Construction of the Sea Custom House and Master Attendant's Office.....	2,330 8 0	23d Feb 49	5th Sept 49	May	49 12th June 50	21st Aug 50

A table of delays.

46

The Collector's
cutcherry at
Cuddapah.

210. The repair of the Collector's Cutcherry at Cuddapah was sanctioned by Government on the 13th September 1848, and work was actually commenced in the following December; it was completed in January 1850, and the bill was made out in the talook in October 1850. Thus fully fifteen months appear to have elapsed between the order for the work reaching the Tahsildar, and its final completion; and it was nine months more before the accounts were sent in, making a total period of two years; and yet the work was simple and of moderate amount, only 2,310 Rupees, and need not have occupied above 3 or 4 months.

The bridge in
Salem.

The estimate for the bridge in the Salem District was sanctioned by Government on the 13th September 1844. The work though of small amount was not completed till May 1846; and the river having filled in the following month, (its proper time,) the arch was carried away; probably as a consequence of the delay, from the masonry not having had time to harden. On the 30th October in the same year the estimate for rebuilding the arch was sanctioned; but though the amount was trifling, less than 700 Rupees, a whole season was lost, and the work was not even commenced till the beginning of 1848, and was not fully completed till May 1849. The accounts were not sent to the Collector till six months later, and the bill for the work only quitted the Collector's office in January 1851. Thus the first construction of the bridge consumed twenty months; the rebuilding of the arch occupied nineteen more; and it took a further period of twenty months to make up the accounts; so that the bill for this trifling work did not quit the Collector's office, till nearly six years after the work had actually commenced.

The road in Bel-
lary, and other
works.

211. In the road work in Bellary again, the estimate received sanction on the 26th June 1843, and the work is reported to have been commenced in the following month; yet though a most simple and easy work consisting almost wholly of mere excavation and embankment, and requiring hardly any skilled labour, it was not completed till January 1845, and the bill was only sent to the Civil Engineer in August 1846. A year and a half was thus occupied on the work, and it was nineteen months more before the bill was sent up. Of the remaining three works, the actual execution in both Tanjore and Tinnevely was much more expeditious, the cause in the former case being, as already explained, that the materials were ready beforehand. But in both there was much delay after the completion of the work, in the transmission of the bill; viz. of nineteen months in Tanjore, and eighteen months in Tinnevely. In Guntoor the execution of the work was more dilatory, occupying seventeen months, of which however, five were due to the necessity of doing over again the roofing badly done at first: in making up and transmitting the bill there was but little loss of time.

The causes of these
delays in the
Tahsildar's cut-
cherry.

212. As to the causes of these delays; passing over those of the delay in execution, to which we have already adverted, those in the other two of the stages which we have now to notice are for the most part undoubtedly to be found in the great bulk, minuteness, and complexity of the accounts, and the want of strength in the establishments to deal with them, and to this cause is to be added, in the case of the Tahsildar's cutcherry, the difficulty and delay in procuring the attendance of all the parties. After a work is completed as already explained, it is measured in all its parts, and the curnum then goes to the Tahsildar's cutcherry with his accounts; but under the system now existing, a copy or rather a translation of these accounts must be made, before they can be used there. The curnum keeps his accounts on Palmira leaf, and in the current language of the district, but the Talook accounts are kept on paper, and almost universally in mahratta; and the curnum therefore has to read over all his accounts to a gomastah, who writes a translation of them in mahratta. Accounts in general tell their own tale; but the village accounts are useless and unintelligible without the explanation of their writer, partly because so bad in form, and system, partly because they are required in the Talook cutcherry, in a foreign language, equally unknown to the people and to their European rulers. Thus not only does the gomastah waste time in making a translation of the accounts, but the curnum loses six or eight days at the least, in going from his village to the cutcherry, and waiting there till he can get attended to.

After the original accounts have thus been translated, the Talook accounts of the work are made up in the manner described above, and the village officers, and in some districts the suppliers of materials and the heads at least of the working gangs, are then sent for to come and sign them. The single maramul gomastah is quite unequal to the task of getting through the preparation of the voluminous accounts required, including the translation of all the village accounts; he therefore, as the assistance of one or more friends, generally brothers, sons, or nephews, not in the service

of Government and receiving no pay. With this aid the accounts are prepared; but after seeing what they are, as we have described them above, we cease to be surprized that so much delay should occur.

213. And the same cause operates in the Collector's cutcherry. We have seen how the Talook accounts are dealt with there, and what processes are gone through to bring them into conformity with the estimates. And the works being so numerous and the establishment very small, this occupies a long time. It is true that the curnum's accounts so carefully transcribed in the Talook, which are the only real accounts, and the only source from which, if only they could be regarded as truthful, any bonâ fide account of the work could be obtained, are totally disregarded in the Collector's cutcherry; but though the work is thus lightened, and though here as in the Tahsildar's cutcherry the aid of unpaid assistants is largely employed, still the work is tedious and must require much time. Hence one chief cause of the delay; another is that the Board of Revenue require that the bills for all the ordinary works of a District for one year shall go up to them at once, and that where several occasional estimates are sanctioned in one list, the bills for all those works are required to be sent up together, except such as may be postponed to another year. These rules cause much delay, because bills that are ready are detained perhaps months till others can be prepared. We consider the restriction to be useless and pernicious, and we shall recommend its abrogation.

In the Collector's
office.

214. These delays are no small evil. As to the dilatoriness of execution; in the first place it postpones the benefits to be obtained from the work, which we may be sure were confidently expected to be considerable, to induce the Government to undertake it; so that works deemed necessary or highly important or profitable, are not in operation till two or three years later than they might have been. But this is not all; the period of execution being protracted, the cost of superintendence is increased. If officers are specially employed on the work clearly so; and even if it is one of the smaller class which is only occasionally visited by a maistry, still he has to go to it so much the oftener, and every visit takes him away from other works, perhaps at a great distance. Again it happens very frequently, as a result of the delay, that the work is done at last at the very worst season, when no work at all ought to be done; and is consequently unsubstantial, or as in the case of the Salem bridge, is destroyed immediately. The delay in execution has also the ill effect under the existing system of greatly augmenting the correspondence, by multiplying the periodical progress reports, the orders for increased activity, the arziees of explanation &c. This however we shall notice presently by itself.

The evils of the de-
lays.

A further effect of the prevailing delay both in executing work and in making up the accounts and submitting the bills, is very much to increase the amount of outstanding advances, in itself an evil. And lastly by deferring so long the period when the expenditure comes under the review of the superior Board or of the Government it much reduces the value of that review; and in a country where the changes among officers of all grades are so frequent as in India, the responsibility of the parties concerned in the expenditure is thus very much lessened.

215. Another incident of the system is that to which we have just adverted, as increased by the delays; viz. the voluminousness of the correspondence and other documents which it occasions, altogether independently of the accounts of the work done. Thus, the practice of making advances involves or is supposed to involve the necessity of long and minutely worded agreements; the absence of efficient and trusty local agents induces resort to the imperfect substitute of detailed and frequent periodical progress reports; and the same cause combined with the habit on the part of the Tahsildars (encouraged by some Collectors) of applying for instructions on all occasions, produces a multiplicity of correspondence between the Collectors and the Tahsildars and maistries, the one party asking for instructions, and the other furnishing them, exhorting to increased activity &c. &c.; and this again entails a similarly large correspondence on the part of the Tahsildar with his subordinates and with the village officials. And the universally prevalent delays greatly increase all this correspondence, and with it the unprofitable consumption of time and labour; unprofitable, because employed on business which by better arrangements would be altogether needless. For when a work is so protracted, it has to be entered in thirty or forty fortnightly reports instead of in six or eight; and as to the correspondence, the very delay is a most fruitful source of injunctions, demands of explanation, and reprimands, on the one hand, and of exculpatory replies on the other.

The voluminous
correspondence
and other docu-
ments.

Examples of this.

216. For instances of the extent of this sort of correspondence we may appeal once more to the six works already so often referred to. Among the papers received from Cuddapah we find no less than one hundred and twenty separate takeeds issued by the Collector and ninety-five arziees addressed to him, all concerning the execution of the simple work of the improvement of the cutcherry. There are also forty eight fortnightly progress reports; twenty four of them being lengthy documents comprising all the works going on the Talook and extending to forty two columns each, and the other twenty four detailed reports of this single work. Again in the case of the Talook cutcherry in the Guntoor district, a work of no difficulty or magnitude, we find 191 takeeds and 152 arziees; there are no fortnightly reports, probably because two copies of the daily accounts are written out and transmitted every day to the Tahsildar's and to the Collector's cutcherries. The papers received respecting the Bridge in the Salem district contain forty nine takeeds and the same number of arziees; but those accounts being so imperfect it seems fair to suppose that the whole number were not forwarded to us. And knowing what the operation of the system is, we are induced to believe that in the other Districts also, where the numbers are still smaller, our requisition was not interpreted to extend to the rigid collection and transmission of the whole of the correspondence respecting the works; and this the more especially as the Tanjore papers comprize twenty six takeeds, but no arziees at all, though it seems certain that those takeeds would not have been wholly unreplyed to. We believe that the instances quoted from Cuddapah and Guntoor may be regarded as fair examples of what the system is in this respect, in the case of masonry works at least; in simple earthwork the correspondence is probably less, though still considerable. Remembering then that the large numbers of letters and orders above quoted apply to single works, and that many such works are executed in a district every year, some idea may be obtained of the enormous bulk of correspondence which passes respecting them. How strikingly does this again contrast with the system in the Road department as described above; and all this difference we must repeat, is traceable to the entire want of an efficient executive agency, in the maramut department.

Frequent journeys of the village officers and others to the cutcherry.

217. The only other point in the system which we will notice is the heavy tax in time, imposed on both the village officials and the people employed on the Public Works, by the practice of requiring them to attend at the Talook cutcherry to receive advances and sign accounts. In all but large works, all advances or payments are made at the Talook cutcherry only. The first step towards the execution of a work is to send for the village monigars and eurnums, who bring with them, in the case of earth or rough stone work (by far the most numerous class,) the headmen at least of the gangs to be employed; and in some districts it is customary also for some of the chief ryots to accompany them. After arrival the necessary documents as above described are prepared and in due time executed, as soon as it suits the convenience of the Tahsildar and the maramut gomastah; and the parties then return home. But the journey has to be repeated whenever a further advance of money is to be made, which will be probably at least twice before the completion of the work. After the work is done, and has been measured by the Tahsildar, the eurnum goes with his accounts to the Talook cutcherry; and when the Talook accounts are ready to go to the Collector's office, the village authorities, and probably the principal ryots, and in some districts the heads at least among the work people, have to go up again to sign them.

The detention there.

218. As already said many Talooks have parts twenty five and even thirty miles distant from the cusbah or cutcherry Town; and the average distance of all, including the near as well as the remote, may probably be ten miles. And the length of the journey is not all, the detention at the Tahsildar's cutcherry is a still greater evil. It is well known that Talook officials set but little value on the time of persons attending on business, and it is probable that in the cases now referred to, at least three or four days are spent at the Talook cutcherry at each visit. And not only are the monigars and ryots taken from their duties and their own affairs for these periods, but the village taliares and other inferior servants are also obliged to accompany them, to the neglect of their proper duties.

To the work people there is a further hardship in being obliged to attend when the work is measured. It is generally some considerable time after completion before this is done, and either the men have to spend the interval in idleness, or they are summoned for the occasion from any other work public or private, on which they may be engaged, perhaps many miles away. In dis-

tricts where it is customary to retain a balance unpaid till after the Civil Engineer's visit, the labourers are subjected to the still further hardship of going up to receive that balance at some later period. All this we cannot but observe contrasts most unfavorably with the Road department. There no one need leave his village. The labourers are dealt with in their own villages, they are paid immediately their day's work is done, and there the matter ends.

PART III.—REFORMS PROPOSED IN THE MARAMUT EXECUTIVE SYSTEM.

219. We have thus gone over the executive system of the maramut branch of the Public Works department; we have examined its operation with care, and have endeavoured to give a faithful account of it. And we think we have shown fully sufficient reason to justify our conclusion that the system is radically bad, and ought to be superseded. The present system cannot be regarded as any thing other than a make-shift: it was adopted at first as the one nearest at hand, at a time when the value of the department and its requirements were very inadequately appreciated, and when indeed the work done was very much less than it is at present. We are persuaded that if the department had ever been looked at with an enlarged view and with a real determination to make it efficient, it would not have been allowed to continue on its present footing so long. But it has never been so regarded, some of its defects have indeed been severely remarked upon from time to time, and remedies have been proposed; but those measures however well calculated to meet some of the evils complained of were too partial; and even they, as they involved an increase of establishment, have for the most part been postponed or refused. And while the known and acknowledged defects of the system were thus left unremedied, Government have not thought it inconsistent to visit with repeated and severe censure the authorities entrusted with its administration; as though the faults observed were owing to their neglect. The Civil Engineer's department has been somewhat strengthened from time to time; but the real executive branch has remained almost what it was at first; and in particular nothing has been done to improve the maistries on whom so much depends, or to increase their very defective numbers.

The present system is bad, and ought to be changed.

220. We thought at first that the present system could be amended and made efficient; but a more careful examination of its working, and especially our investigation of the Road Department, led us to the conclusion that such an attempt must be a failure, and that the expense essential to any effective improvement of it would be much better employed in organizing a better system. Some of its more prominent evils, indeed, might be corrected, better forms of accounts might be introduced, and a better course might be adopted as regards estimates and bills; but still the great evils would remain. We have already noticed in the course of our remarks how all the main defects are traceable to the absence of skilled and trusty executive agents; and without a change in the system the same want would still remain, with all its accompanying evils. And indeed the same want of instructed and well controlled agents would render nugatory, any attempt even to improve the accounts; for we have seen in the Road Department that it is not sufficient to introduce good forms, but that strict and careful oversight is necessary to enforce their observance; and if this is so in a new department, much more would it be in the case, in changing an old and long established system in the face of prejudice and opposition. And if the increased strength and the training necessary to provide an efficient agency are given, it seems so obviously better to place it under proper professional superintendence than to continue the present anomalous distribution of duties that we need say nothing on that point. We have detailed in our first Report the establishment which appears to us absolutely necessary for efficiency, and we regard this change in the system of controlling them as the proper and necessary complement

The executive agents must be placed under direct professional direction.

of that reform. Indeed if the Revenue Officers are unable, as we have seen, to control the execution of Public Works at present, it would obviously be still more absolute an impossibility for them adequately to control the larger establishments required.

The proposal is not new.

221. We propose then to place the executive under Engineer Officers; and we would observe that this is not a new proposition. The Marquis of Tweeddale was fully convinced of the necessity of such a change, and in his Minute of the 18th Aug. 1846 he proposed to have an Engineer officer in each district as the head of the Public Works Department within it, under the Collector. No doubt this would have been a step in the right direction; it would have placed the execution of works in each district under a trained officer with that as his main business, and we cannot doubt that a material improvement of the department would gradually have resulted. This however would have been only a half measure; the Collector would still have been in the anomalous position of head of the executive, and the subordinate Revenue Officers from the Tahsildars downwards, without any training or preparation for the work, and with other more pressing duties to attend to, would still have been the principal agents.

A more entire change was recommended by Major Pears of the Engineer Corps, when holding a temporary seat in the Military Board; when (in his Memo. of the 18th February 1859) that officer warmly advocated the entire separation of the executive functions from the Revenue Department, and the formation of a purely Executive Agency.

Various reasons make the change necessary.

222. It is our opinion that such entire change is necessary: the Revenue Department is wholly incompetent to the duty, and we are convinced that so long as their agency continues to be employed in any material degree, improvement will be resisted. Every Collector knows how strong an antipathy exists on the part of the subordinate revenue functionaries against the Officers of the Civil Engineer's Department; how perseveringly they endeavour to thwart them, to oppose any measures of improvement proposed by them, and even to spite them personally by little slights and indignities. This may be due in part to their ignorance of any thing better than the old system in which they have been bred, and an intuitive dislike and jealousy of innovation from without; but it is impossible to discard the belief in still more culpable motives. We have ample evidence that the vesting the subordinate revenue officers with the execution of works is to be deprecated for other and more serious reasons than even their incompetency; that it gives them facilities for fraud, extortion, and coercion, to the injury of both the Government and the labourers employed, and that it makes the detection or prevention of such wrong extremely difficult, because the whole body of Government servants in the district, including those immediately about the Collector, are banded together by a common interest to conceal it. Practically the Civil Engineer's Department is the only agency by which such misdoings can be brought to light, and it is easily conceivable therefore that they should be looked at with a very jealous eye. At present indeed there is no responsibility in the executive department. The Collector is the official head; but it is so obviously a physical impossibility that with his many and multifarious duties he should really be under responsibility for the right working of the department, that he is never so regarded. Yet this nominal responsibility of their European superior is sufficient to shield the Tahsildars and other subordinates, as it keeps them out of view; and even a Collector, though he may be anxious to discover and remedy abuses himself, or by the means of his own agents, is not unlikely to resist the imputation of them from without, as a slur on the efficiency of his administration.

Major Pears' scheme.

223. Major Pears' proposition regarding the executive very much coincides with our own; though he arrives at his conclusions by a different process. He argues on abstract grounds (Para. 4) that if it is impracticable to obtain a department complete in all respects, both as to execution and inspection, it is better to look first to the former, to get a good executive at all events; and he then goes on to point out the advantages that would result from such a change, in the present case. We on the other hand, after going carefully through the actual working of the existing system, viz., that of an untrained and incompetent executive attempted to be controlled by professional officers destitute of direct connection with it or power over it, have arrived at the conclusion that this system has failed, that it is vain to hope for improvement while things remain on their present basis, and that the executive functions ought to be transferred to a trained and competent agency.

Major Pears' paper contains some just and valuable remarks. Speaking of the incongruity of the incongruous duty now imposed on Collectors and on the expediency of relieving them from it, he says, "In every respect such a change would be advantageous to the Collector. Responsible for the discharge of his duties, and the use of means at his disposal as a Revenue Officer, he would be no longer responsible for the maintenance of a portion of those means, the works of irrigation; and would be quite ready and in most cases able to watch and criticize the proceedings of those who were so." The whole paper will be found in Appendix A, and is well worth attention.

224. The scheme was referred for the opinion of the Board of Revenue; who expressed dissent from it, declaring their opinion that the execution of the works in general ought to remain on its present footing. And they stated their belief that the measures necessary for making the executive efficient, were to give each Collector an Engineer officer as an Assistant, and to increase the number and the emoluments of the maistries.

The opinion of the Board of Revenue upon it.

The Board's letter to Government does not give the grounds of this opinion; but on examination of the minutes recorded by the several members, it is apparent that one prevailing motive at least was the belief that the authority and influence of the Collector, and of the subordinate revenue servants, are necessary to procure the execution of work. Thus one member mentions it among the advantages of making the district Engineers assistants to the Collectors, that the Engineers "thus belonging to the district establishment," would be "able to exercise such authority under the instructions of the Collector," as might be necessary in the performance of his duties. Another member expresses strong doubts as to "the efficiency of an executive department not having full authority and control over the local native (revenue) officers." And a third declares his conviction that the executive officers could not move a step without the assistance of the revenue functionaries.

225. In stating our belief on the other hand that such extraneous authority is not necessary to an efficient executive, we have actual examples to appeal to. The whole work of the Road department ever since its formation, wherever it has been itself executive, has been carried on by an agency of its own, independently of the Revenue Department; and we have already recorded our opinion how cheaply and well that work has been done. Nor is this all, various projects of magnitude in different parts of the country, and both to irrigation works and roads, undertaken in the maramut department under the Board of Revenue, have been entrusted for execution not to Tahsildars but to European officers, Engineer or other. And we have given a number of instances in our First Report in which such officers have both found labourers coming forward in crowds when the Tahsildars declared that none could be procured; and have obtained plentiful supplies of materials, at prices much lower than had ever been charged before on works in the same localities executed by the agency of the Tahsildars.

The aid of the revenue officers is not required.

We would particularly notice the case of the Cheyaur Anicut and works constructed last year. Mr. Revenue Surveyor Bush, who ably superintended the execution of those works informs us that he was entirely independent of aid from the revenue authorities; as respects both workmen and materials; that the rates paid by him for labour never exceeded those established in the Talook, (for materials they were much lower;) and that not only had he abundance of labourers at those rates, but that full grown men offered themselves even at boys' rates for the sake of getting work; and that many followed him for employment to the work on which he is now engaged near Poonay, many miles from their homes.

226. Further we are bound to declare that we cannot but regard the entire separation of the Revenue Officers from all concern with the executive, as essential to the cessation of the practice of pressing or forcing labour. We adverted briefly in our First report to this practice, and stated that there appeared reason to believe that it prevailed to a greater or less degree in every district. Since then we have learnt that this system has received the sanction of some of the highest authorities of the Presidency, on the ground that labour cannot be got for large works on other terms; and that, supported by such sanction, it is now in full activity at the works on the Kistnah. We need not here enter on the enquiry what is the real meaning of the term "necessity," as here employed, or how far such a necessity justifies this violation of personal freedom; because we conceive there is abundant proof that the argument is based on a mistake of fact, and that volun-

The change of system is necessary in order to put a stop to forced labour.

tary labour may be had in any quantity required, provided only the men are taught to feel confidence that they will be fairly and punctually paid. Many examples prove this beyond a doubt, and indeed all those referred to in the preceding paragraph are equally applicable here. We will however cite in this place two cases of peculiar force; the Hussanoor Ghaut and the road through the Walliaur jungle.

The Hussanoor
Ghaut road.

227. In March 1844 an estimate to the amount of 20,000 Rupees was sanctioned, for making a road practicable for carts through the unhealthy jungle of the Hussanoor pass, leading from Suttimungalum in the Coimbatore District, to the Mysore country. A trace had already been made, and a pathway opened; and both the Engineer officers successively engaged on that work caught fever, and one of them died. There had been much sickness also among the inferior servants employed and among the labourers. After the estimate was sanctioned the execution was entrusted to a European Overseer, but he also was compelled by fever to leave the work, in April 1845, after being only six months employed on it. It was then attempted to carry it on by the agency of the Revenue Officers; but there was much sickness and many deaths among the labourers and servants employed, and after a time the attempt was abandoned, and the work came entirely to a standstill. In May 1848 Lieut. Chauncy was appointed to the charge. All the previous operations had been carried on by means of labourers supplied by the Tahsildars, and the men had been kept at work by peons like convicts. When Lieut. Chauncy took charge of the work, the Collector ordered the Tahsildars of several talooks to send labourers to it, and small parties were brought by peons from some of the talooks, with many excuses that numbers of men had escaped on the road.

It was made by free
labour.

228. Lieut. Chauncy immediately sent away the peons, and told the labourers they might go also if they wished; but at the same time he promised them regular pay if they chose to stay and work. Most of the men thus brought by force to the work were miserable wretches; some however staid and they were punctually paid at the end of each day; this soon attracted more, and in a short time there were 2,000 voluntary labourers at regular work. It was soon found practicable to discontinue the daily payment, and the men themselves preferred being paid weekly. At first the people would only engage to work at the lower part of the Ghaut; but as they gained more confidence, and were told also that the rates for work farther up would be higher, they overcame their objections. The greater part of the work at the upper end of the pass was done by men from the Mysore country, who came from long distances; some of them as much as 60 miles, and few less than twenty. They came in parties, huddled themselves near the work, and remained for weeks or months. At the time of Raghee harvest many would go away as they had fields of their own to reap, and also at the time of ploughing and sowing, when a good rain fell. Numbers of men got fever, and then they were either treated by a dresser who was at the work, or were taken away by their friends to their own villages. But though the number thus fluctuated somewhat, yet there were always enough to carry on the work vigorously; often there were as many as three thousand men employed. Though the work began so unfavourably and was in so bad a locality, yet after the first fortnight there were always as many men as could be conveniently employed. And thus the work went vigorously forward till it was completed.

The Walliaur road.

229. A similar instance may be cited in the construction of the road from Coimbatore to Paulghaut under the same Officer. In that case also the work lay in a dense and unhealthy jungle, remote from inhabited places. But the same means so effectual on the Hussanoor Ghaut, were found to succeed equally well here. No man was asked to work against his will, but prompt and full payment was secured to all who came. The work was much smaller indeed than that on the Hussanoor Ghaut, and there were never more than from 300 to 400 men employed; but from the commencement of the work to the close there never was a want of hands.

Very moderate
wages are suffi-
cient, if fully and
punctually paid.

230. And the course which we here advocate is not only demanded by justice and humanity, but is also expedient on the ground of economy. It would indeed be a wretched argument that because labourers will not come to a certain work for the usual wages, they must be forced to it; it would be far better, because it would be the part of justice, to pay three annas or even four annas a day if necessary instead of two. But the fact is not as here supposed. It may be true, and probably is, that men will not work for a nominal two annas a day, when they are really mulct-

ed of a part of it, and are also subjected to coercion and abuse; but it has been proved over and over again that if they are invited and not driven, are treated kindly, and are taught to feel confidence that they will receive the full ostensible rate of hire, they will work willingly for a lower rate than is now actually paid by Government for their labour. The rate usually charged for ordinary unskilled day labourers by the Tahsildars throughout the country is 2 annas a day; and sometimes if allowed they will charge 2½ annas. When Lieutenant Chauncy began the work at the Hussanoor ghaut he at first paid the wudders or tank diggers 3 annas a day; but he was soon able to reduce this to 2 annas for the upper part of the ghaut, and As. 1-8 for the lower part. And it must be remembered that the men employed on the upper part came a long distance, and had to hut themselves, and their hire only commenced from the day they began actually to work. And these moderate rates it must be repeated were found amply sufficient to secure abundance of voluntary labour on a work justly as unpopular from the circumstances of the locality, as any that could well be undertaken.

On the Walliaur road the rates paid were As. 1-8 (two pence half penny) for very heavy work, and 1 A. 6 P. for ordinary work; and to earn these wages the men had to walk every day six miles to their work and six miles back. Yet they worked willingly at those rates.

And the same officer informs us that the rates of hire now established on the western parts of No. 1 Trunk road viz. from the 129th mile all the way to Bangalore is As. 1-4 for men, and one anna for women; on this side of the 129th mile the rates are somewhat higher. Further, at the Naycoondy bridge on the Trunk Road No. 1, and at the Chittoor bridge, the men get only As. 1-8, although in the latter case the work is close to a large Town. And at these rates labourers are readily obtainable.

231. We feel warranted by the facts here adduced, and we might quote others from other officers in different parts of the country, in declaring that coercion is not necessary to obtain labour for the Public works of the country; in pronouncing it to be fully proved not simply that Engineer officers unaided by Tahsildars and peons can procure ample supplies of labour, but also that they can procure it at rates certainly not exceeding, and often below, the rates now charged for the labour employed. We would particularly insist on the proof afforded by the Hussanoor ghaut and the Walliaur road. In both these instances the work was in dense jungle remote from the habitation of man; there was therefore no body of labourers on the spot desirous of employment near their own doors, but every man employed came from many miles distant, and was unavoidably subjected to physical privations; and still more, in both cases fever was to be feared, and did actually attack many of the men. We say then that if in any case a work would be likely to come to a stand for want of voluntary labourers, these would be the works; yet in fact abundance of labour instantly responded to the call and that at rates never exceeding except in the case of the first mentioned work for a week or two, and generally below, those usually charged for similar work in unexceptionable localities. These two examples then even if there were no others, and there are many, fully prove the proposition stated in the beginning of this paragraph.

232. But we must declare our firm persuasion also that so long as the revenue officers are the employers of the labour, or so long as they are relied on for its supply, coercion will be employed; and because that fails or barely succeeds, the belief will still be entertained that it is necessary, and that without it the failure would be complete. When a Tahsildar is ordered to supply labourers for any Government work, let us suppose the Kistnah anicut, he sends out a number of peons to collect men and escort them to the spot. Now every one acquainted with the habits of the peon class will see at once that the occasion will be a harvest to them. First they begin by taking money from those who can pay, to avoid being carried off to the work; but with that part of their proceedings we have now no concern. In due time they reach the work with a gang of men; if that is under direct European superintendence, it is probable that the hire will be regularly paid to the labourers; but even then such are the means of annoyance within the power of the peons that they have little difficulty in securing a share of it to themselves. Thus the amount of hire is diminished to the labourer; but this is not the only cause which makes such employment distasteful to them. Though they have not sufficient independence to resist coercion, they have enough to make them dislike it; and this feeling unites with the aversion to being plundered, to make employment on the Public works unpopular with the labouring classes under such

The foregoing facts
prove that free
labour can be
readily obtained.

But as long as the
Revenue officers
employ or supply
labour, it will be
forced.

circumstances. But these means, bad as they are, are the only means in the power of the Revenue authorities to supply labour, and it is not in the nature of things that they can be much amended; and we say therefore that the Revenue Officers ought to be entirely separated from the work. All that is wanted on the part of the Engineer officers to give them the command of the labour market, is that the men shall be fairly treated and punctually paid; this has been proved by actual trial over and over again, and those who have made the trial, as for example the Officers of the Road Department, Lieutenant Chauncy, Revenue surveyor Bush, and others, all declare that they want no aid from the Revenue Department. All that is necessary to produce the same results universally is that the Engineer should be thrown on his own resources, and be cut off from depending for a supply of labourers on a Tahsildar or any other Revenue or Police officer.

The change would raise the character of the revenue servants.

233. Lastly we would advert to the evidence which we have adduced, of systematic peculation and fabrication of accounts existing in the Department. It appears clear to us that the former of these in particular is very greatly favoured and facilitated by the present system under which the whole power in a Talook in all departments is vested in a single set of officers. No arrangement could be better adopted to ensure secrecy and impunity to any fraudulent practices; the whole body of Government servants being bound together by a common interest to conceal them. Even were the character of the revenue officers generally much higher in point of probity than it is, we should consider such a system dangerous; and under the actual circumstances, we should have expected only such a state of things in this respect as appears in fact to exist. The department of Public Works from the large expenditure going on in it, the bad and confused system of the accounts, and the powerful control exercised by the Tahsildars over all parties both receiving money and concerned in its disbursement, is one of the most demoralized in the revenue branch of the service, second only perhaps to the administration of the salt monopoly. We believe that when an efficient executive is constituted distinct from and independent of the revenue servants, with simple and lucid accounts, and under direct European superintendence, the effect will be very beneficial; not only in rendering the Public Works Department itself more honest, but indirectly in raising the tone of the whole subordinate revenue department.

The executive ought on every consideration to be a separate department.

234. For the foregoing reasons we must declare our conviction, not only that the co-operation of the revenue officers in the execution of Public Works is not necessary, but that it is positively injurious. It is injurious both to Government and to the working class. Independently of the fact that this union of functions lays work of a peculiar kind on a class of servants unprepared for it by previous training, and otherwise fully occupied by very engrossing duties, and that it almost necessarily involves the forcing of labour, we regard the very concentration of such various functions in one body of men as objectionable in itself, and as likely to lead to those abuses the existence of which we have had to notice. And we regard the separation of these functions, and the employment of a distinct agency for the Public Works as most desirable, even if for no other reason than to break up the unity of class feeling and interest now existing.

While therefore we readily admit that the measures proposed by the Board of Revenue, viz. to have in each Collectorate an Engineer officer as an assistant to the Collector, with full control over the execution of works, including all accounts connected therewith, and to augment the numbers and the salaries of the maistries, would be a very great step in advance of the present system, and would lead gradually to material improvement in the efficient and economical execution of work; we must nevertheless declare our conviction that these measures would still leave some fundamental evils of the present system untouched, and that the executive can only be placed on a satisfactory footing by making it a separate department.

Collectors would have full means to ensure the due repair of works.

235. It may perhaps be objected to the plan of constituting a separate executive, as we believe it has been before, that such an arrangement would deprive the Collector of a part of his proper control over matters affecting the Revenue. But we cannot but avow our opinion that this is a mistaken view, and that the Collector's immediate connection with the executive does not in any measure or in any degree, contribute to the security of the Revenue. It is undoubtedly necessary that the Collector should have the means of ensuring the due repair and conservation of the works of irrigation, since the Revenue would suffer by their neglect, but this power would be fully secured to him under our proposed system. He would have precisely the same means as at present of obtaining information of cases in which the neglect to repair a work had caused or was threaten-

ing a diminution of Revenue; he would even have better means, for Tahsildars and other Officers will be far more likely to make known such neglect, when the blame of it does not rest on themselves. And having received such information, it will be the Collector's part to make it known to the Engineer Officer whose duty it may be to apply a remedy, and who will be under a clear and definite responsibility for any omission to do so.

236. So also as to improvements; not only would it be quite open to the Collector to bring forward all projects of that nature which might seem to him worthy of investigation or prosecution, and to lay them before the Board of Public Works if the local Engineer Officers should seem to him to treat them slightly; but the right or the duty of declaring his opinion upon the merits of every project originating in any other quarter, for improving either the irrigation or the means of communication, should still be preserved to him. This function, we think properly belongs to the Collector, as the custodian of the Revenue, and the general representative of Government within his district; he should be, as Major Pears expresses it, the official authority on the probable effect of a proposed work, both with regard to the Revenue and to the general interests, as the Engineer is and still should be on the professional part of the subject. But such a work having been determined upon, the mere carrying the design into effect is an entirely distinct operation, in which considerations of Revenue do not at all intermingle, and for the direction of which the Collector has none of the special qualifications required; and even if he had, he has not the necessary leisure to perform the duty effectually.

And to advance improvement.

237. Having thus set forth the change of system which we advocate, we will now briefly explain how the plan would be carried out in its details.

Detailed arrangements of the new Executive.

In the first place the whole of that part of the Establishment which we have set down for the Collector's Department would be transferred to the District Engineer. And we may here observe that at the time when we planned that Establishment we had not yet fully examined the working of the Executive, and had not resolved to recommend a change of system. We then only aimed at such a strengthening of the various parts of the department as would make it competent to the efficient discharge of its duties under the same distribution of functions as exists at present. But after we had more closely investigated the actual working of the present system, and compared it with that of the Road Department Executive, we became convinced, long before our First Report was submitted to Government, that a thorough change was required; and as we found that the same strength of establishment which we had fixed on after most careful and anxious deliberation as the minimum of efficiency under the old system, would be sufficient under proper arrangements not only to furnish trained executive agents and in sufficient numbers, but also to provide professional and skilled direction and control over them, in place of that by the incompetent and unskilled Revenue Officers, we do not hesitate earnestly to advocate the change. This as already observed involves the transfer of the establishments above referred to; it may also involve a change in the number, denomination, and salaries of some or all of one class of officers, viz. of the District and Talook gomastahs as we shall explain presently.

238. The following is that distribution of the executive duties in the Provinces within the Frontier, which under the new system would probably be found the best. The arrangement is based on the executive system of the Road Department, which we have already described. It may be as well here to mention that in this place we assume the Road Department to be abolished, as we so strongly recommended that it should be, in our First Report; we also suppose all Military works within the Frontier, except at the Presidency itself, to be under the same Department as the Civil duties, and thus the arrangements which we are about to detail are designed to meet the wants of every branch of the Public Works Department in the Provinces. As respects the works in the Divisions beyond the Frontier and in the Presidency Division, we are of opinion that executive arrangements analogous to these should be adopted there also as will be explained in the succeeding Section, on the Executive of the Military Department.

Division duties. of

239. The establishment proposed in Section IX of our First Report comprises fifty nine Sub Engineers and sixty four Overseers, for the irrigation and communications in the Provinces; exclusively of twenty of each class allotted to special Projects and Works. There are thus 123 European Subordinates who would be available for supervising the execution of works during the working season, besides thirty five superintendents and deputy superintendents of Maramut, who might properly share in that duty, making a total of 158. And supposing one-fourth of that number to

The Executive Agency.

be engaged on other duty, as for example in personally directing the execution of works of magnitude, we have about 120 officers available for the immediate administration of the executive. This would be on an average six such officers to each Collectorate, or something less than one to every two Talooks: or as the whole twenty Districts contain 138,000 square miles, there would be one such officer to every 1150 square miles. This seems a very extensive charge for such a purpose, but by good management we are satisfied that this number would be found sufficient to work a system analogous to that of the Road Department.

Its distribution.

240. The agency would not in fact be distributed equally: a larger proportion would be concentrated in those districts and parts of districts where the works are the most numerous and important. In each Collectorate the executive would be under the control of the district Engineer, aided in probably eight or ten of the largest and most important districts by an assistant. The districts would be distributed into divisions, each under a member of one of the subordinate classes just spoken of, and whom we may here call by the general term executive agent. These persons would perform in their divisions the same functions as the Overseers in the present road department, that is they would set the works agoing, would visit them from time to time while in progress, cash tickets, measure and pay for work, &c. The executive duties of the maistries would be for the most part confined to masonry works including bridges, though they would also be employed in making roads under the Overseers. Each executive agent would as a general rule have the charge and oversight of all the works in his division of all kinds; whether the ordinary repairs in earth and rough stone to tanks and channels, road work, bridges and tunnels, or buildings of whatever nature. But it would often be expedient to make a large work, such as a principal road, a large bridge, an anicut, a new tank or channel, a special charge under a separate executive agent; who might then be fittingly entrusted with the oversight of other minor works in the neighbourhood of such his principal charge.

Mode of executing work.

241. Now with regard to the subordinate arrangements. As respects bridges and all road work, whether construction or repair, and also in the case of anicuts, sluices, aqueducts, and all the other ordinary structures pertaining to irrigation, we are of opinion that the exact system now followed in the road department, and which we have fully described above, should be universally adopted, with the few modifications in the forms of accounts and books which we have pointed out. Under that system, there will be at every place of work a maistry, a pygust, or a conaca-pillay, for the purpose of engaging labourers, directing their work, and issuing tickets, and these men will also keep the station books, and will be responsible on pain of fine and dismissal that the work does not lag.

As regards buildings generally also, the same system will probably be found perfectly suitable, with some little adaptation of the accounts to the greater number and variety of the sorts of labour and materials used.

Tank and channel work.

242. As respects earth work to tanks and channels generally, and especially where there are deep excavations, the system will probably need some modification. Work of this description is performed for the most part, by the class or caste commonly called tank-diggers, who are organized in gangs, and are habituated to work by piece-work, at a certain rate per cubic yard excavated. Very great delays are experienced at present in employing these people, for which there are various causes; 1st, it is the practice to give them large advances, which they improvidently spend and then have nothing to live upon; 2nd in other cases, viz. where it is the practice to entrust the disbursement of the funds to the village officers, the people are far too scantily supplied, and are cheated in being obliged to receive grain at a very dear rate instead of money; 3rd, their work is measured only at very long intervals, and they are kept long waiting for the balance due to them; 4th, they are obliged to submit to deduction from what is their due. It has been proved however that when fully and punctually paid these men will work steadily: and we would particularly appeal to the case of the cheyanr channels, where three thousand of this class were in constant employ for several months.

The Cheyanr anicut and channels.

243. There the Overseer himself showed them their work; he gave them only small advances, but every eight or ten days he measured carefully and fairly the work done, and paid for it; always however leaving a small balance due to them. Under this treatment, and seeing themselves fairly and honestly dealt with, the Tank-diggers worked as steadily as any other class; and they were

so well pleased with the system that many of them followed the Overseer to his present work. In one respect Mr. Bush's arrangements seem to have been defective; viz. that he did not determine the rate to be paid in each case, till he measured the work. His reason was that in the deep cuttings the soil below varied so much from that at the surface that a rate could not be fixed beforehand; but admitting this to be so, the same reason does not exist in the ordinary work of the Department, which is of no great depth. The fact, however, that with this uncertainty the men still worked steadily and willingly, is a strong proof of their confidence in the fair dealing of the Overseer, and shows how effectual such fair dealing is in changing their bad habits. We may add that it seems to us to prove also that it was not necessary to retain unpaid any part of the amount due. Mr. Bush's reason was that this class of labourers are so unstable that it was requisite to keep this hold upon them; but it is evident that they were too well satisfied with the treatment they received to be inclined to leave the employment.

244. What we have here to observe however is that it seems doubtful whether under the circumstances thus stated, it will not be better to retain the piece-work system, in place of using tickets; more particularly where the cutting is deep. This however is a matter of secondary importance; it may well be left to be determined in each case, and experience will soon lead to the best system. The essential requisite is that whatever method is adopted, the men shall be paid punctually, fairly, and frequently; and shall thus be taught to feel that they are honestly dealt with. In either case however, viz. whether the ticket system or the piece-work system is adopted, the quantity of writing and of detailed and complicated accounts will be very much lessened and simplified.

Rough stone work, of which also there is a great deal in the Irrigation Department is performed by a similar class of men to the tank-diggers, and who work on similar terms: in case of that also it may be expedient to retain the piece-work system, which, we may notice, is done even in the Road Department.

245. Reverting now to what we have said above respecting the Talook Gomastahs, we would observe that the system which we propose to introduce would effect so extensive a diminution in the present enormous bulk of useless writing, that probably the services of all those Officers would be found unnecessary, not only in the place assigned to them in our proposed Establishment, but in any other place, as gomastahs or accountants. The organization of the Department would not be by Talooks, but by Executive Divisions: that is, each Division Agent would superintend all the works within his range, would draw and disburse the money, would collect the Station books, and would send them with the other vouchers, and with his own Cash book and the bill prepared from it, to the Office of the District Engineer. Thus the enormous amount of labour expended under the present system in "making up the accounts" in the Talook Cutcherry, would be entirely saved; it would not be transferred or merely diminished, it would cease to be performed at all. The examination of the bill in the Office of the District Engineer, and the comparison of it with the vouchers, would of course require the aid of accountants; but both the bill and the accounts on which it is founded will be in a clear form and small compass, and the examination and verification will be a simple and easy operation.

And as respects the bills we must add that the saving of time and labour will by no means be the whole advantage, there will be the still more important gain of truthfulness also. A bill will no longer be a complicated manufacture as it is at present; it will be simply a condensation of all the facts recorded in the daily accounts.

246. And besides this saving in the preparation of the bill, there would be much economy of labour also in the matter of the repeated copyings and translations of estimates, diaries, and correspondence which now occupy so much time, but which under the new system would be almost wholly dispensed with and annihilated. We do not feel ourselves in a position to state categorically what strength of Office Establishment will be wanted to work a new system, as we could do in the case of one long established; that must be left in great part to actual trial, but we have no hesitation in declaring our full belief that the Establishment assigned in our scheme to a Collector's own Office, (viz. two writers, two accountants, and two gomastahs) will fully suffice conjointly with the Establishment there allotted to the office of a District Engineer, for all the office work of the latter. This would leave the whole sum allowed for the Talook Gomastahs,

Punctual and fair payment is essential.

Great reduction in accounts and correspondence.

The office establishments.

unappropriated, amounting to above 46,000 Rupees yearly; and this sum would be available for the payment of Pagnats and Conacapillays.

The execution will be prompt.

247. Under a system such as we have described, the Public Works Department will be independent of Tahsildars and other revenue servants, engrossed as they are by their proper and primary duties. It will choose its own time for commencing work at any place, the time best as regards the work, and the most convenient as regards its own other engagements. An officer or an Executive Agent will set the work going; and leave a Conacapillay with a due supply of tickets, secure that the work will proceed, that under the influence of prompt payment for each day's work, there will not be a want of labourers. Or if the work be done by the piece, small advances, frequent inspection, and prompt settlements, will prevent delays and evasions. The work will advance as rapidly or as slowly as is deemed expedient, but always much more quickly than at present. All the works within a convenient and limited circle will be undertaken at once, so that all those in progress at the same time may be visited by the Executive Agent at suitable intervals; when that circle of works is completed the agent will commence another, and so on through the season.

Great waste of superintendence under the present system.

248. At present a maistry who does his duty has to go backwards and forwards from one extremity to another of his extensive charge to visit works which ought to be in progress of execution, but which either are not begun, or are advancing at a scarcely perceptible rate. And not only is he without power to hasten them, but no existing power is or can be efficient to do so, under the various opposing influences of incompetency or self-interest in the village officers, want of leisure in those who ought to coerce them, and the other causes which we have endeavoured to present. We have nowhere seen it noticed how great an amount of superintendence must be wasted under such a system; and we would point out how great must be the saving where the executive confine their operations at any one time within a limited space, and have full means of commencing any given work at exactly the most convenient time, and carrying it forward at the most convenient rate of progression. The actual experience of the Road Department as well as numerous instances in the Maramut Department under European Overseers, fully justifies us in asserting that an efficient executive will have the command of the labour market to this extent; and it justifies us in going still further, and affirming that in the course of a few years a body of workmen of all kinds will be formed in each district, who will work regularly for the Public Works Department in it, moving about from place to place wherever labour is wanted. Thus trained, they will learn the use of better tools, and a more active style of working, and their labour will thus become cheaper to the department, while they themselves will earn better wages.

Functions of the Collectors in connection with Public Works.

249. It may be proper here to notice the duties which under the new system will rest on the Collectors in connection with Public Works. We have already declared our opinion that the Collector ought to be consulted on every proposed improvement as well of irrigation as of the means of communication; and whether the proposed work be entirely new, or be merely an enlargement or improvement of an existing work. It should likewise be his duty to suggest to the Engineer's Department any measures that might occur to him for promoting the improvement of his district whether as to irrigation or roads. It will also be undoubtedly proper that all estimates for repairs, whether to irrigation works or roads, should be countersigned by him before being executed, in the same way as estimates made by Superintending Engineers even for the ordinary repair of Military buildings require the approval of the Commanding Officer. The proper course we think would be that the District Engineer should send such estimates to the Collector who if he found nothing to object to would return them with his countersignature; or in the other event would state his objections or request explanation. In case of continued difference of opinion the decision would rest with the Board of Public Works.

It would further be the duty of the Collector, in which he would be aided by the Tahsildars, to signify to the District Engineer every case requiring the attention of his department; whether damage to a tank, channel, bridge, or road, by heavy rains or floods, or the decline of the cultivation and revenue under any work through omission to repair it.

As to the Revenue Buildings, the course would be similar to that which we propose to establish in the other Departments. In the case of repairs, they would be estimated for and executed as speedily as possible by the Executive Department; and as to new works and improvements they would be applied for to Government through the regular channel by the head of the Department.

250. One measure which we have already spoken of as highly necessary in itself, as a means of obtaining due control over the works of the country, will also be specially necessary to the efficient working of the new system. A statistical register must be made of all the works of irrigation, showing their nature and circumstances, their state of repair, the extent of land under them, the extent of cultivation and amount of revenue from them for a series of years, the improvement of which they are susceptible, &c. These Registers should be printed, and a copy should be in the hands of every considerable officer of both the Revenue and the Engineer Department of the District. They should be supplied to the Collectors and their European Assistants, the Tahsildars, Deputy Tahsildars, Peishcars, and Turrufdars, and to all the Engineer Officers, the Warrant and Non-Commissioned grades of the Department, to the Superintendents, and to all foremen having any independent charge. The Board of Revenue and the Board of Public Works should also be furnished with copies.

Statistical registers of the works of irrigation to be prepared.

251. The advantages of making such information so generally known throughout the Department would be very great; and though it would undoubtedly be necessary to revise and reprint the Registers from time to time, the cost of this would be well repaid. In the intervals between the reprints each Officer might be enabled and should be required to keep his copy correct on some points at least, by means of circular orders from the head of the department notifying changes in works. For the purpose now more immediately in hand these Registers would be very useful in informing Officers as to the cultivation and revenue of works, when contemplating their improvement or estimating for their repair; and the information on these points would be quite sufficiently accurate even though two or three years old. Such Registers ought to be prepared and printed with the least possible delay, and though it would take much time to make them perfect, yet that consideration need not by any means delay their being published, for it will be much better to have them even imperfect, than to be entirely without such valuable aid. They may be amended from time to time; and their very publication, though in a defective state, will lead to their more speedy perfection; for being already in the hands of many Officers, improvements and corrections of mistakes will be rapidly suggested.

The great utility of such registers.

252. Again, no time should be lost in making lithographed copies of the large Trigonometrical survey map, on the scale of half an inch to a mile, for each district separately; and copies of this for their own district should be in the hands of all the members of the department above the grade of Foreman at least. They would also be very useful to the Revenue Officers; and Talook copies on a still larger scale might be made. Plans of all the chief works of irrigation should also be made, and multiplied by the same means, and should be distributed to all persons concerned in the custody of those works respectively. All necessary instruments also should be supplied in abundance; and both as respects maps and plans and instruments, too much rigour should not be shown in case of dilapidation or injury. Such things are made for use, and being used must suffer wear and tear. But it is much better for the interests of Government that they should be constantly used, even though somewhat roughly, than that they should be kept unemployed from fear of injuring them.

Maps and instruments should also be abundantly supplied.

253. It may be useful also to give an outline of the duties which we contemplate as to be performed respectively by the Inspecting Engineers and by the District Engineers and Executive Officers. We will begin with the District Engineer, whose functions according to our view of them should be as follows.

Duties of a District Engineer.

First. He will make estimates both for repairs and for new works and improvements. Certain of his subordinates also, especially the Sub Engineers, and such Overseers as may be deemed competent, will also make estimates, under certain restrictions as to nature of work and amount; and these estimates will come to the District Engineer for approval and confirmation, which may be given either at once, or after actual inspection, as he may think proper in each case. Such of these estimates as he may approve, as well as his own, he will forward for sanction. Those for works such as the Collector is competent to order, viz. repairs to irrigation works and to all buildings, as well as improvements to irrigation works and roads within certain limits, will be sent first to the Inspecting Engineer; who if he approves will countersign them and transmit them to the Collector; and the latter if approving will authorize their execution.

He will make and submit estimates.

Such estimates as require the sanction of Government, which under our proposed rules will always be for new works, or improvements of considerable magnitude, should be sent first to the

Collector; and with his countersignature and opinion to the Inspecting Engineer, who if approving will forward them to the Board of Public Works with his own recommendation. In the case of roads and irrigation works, the estimate will generally accompany the first report on the project; and a report from the Collector will also be required to go up with it. In the case of buildings in all departments the approval of Government of the proposed work will be required before the estimate is made.

Will execute work.

254. Second. A second duty will be to arrange for the execution of all work sanctioned; both that on estimate, and on permanent annual allowances for made roads, and perhaps ultimately for channels; and to supervise the execution by his subordinates. He will obtain funds for this purpose from the Collector; and in Section VI we shall propose what we think the best mode of doing so.

Will verify and submit bills:

Third. He will receive, revise, and submit for sanction through the Inspecting Engineer the bills for work done. According to the mode set forth above, the bills will be prepared by the Executive Agent immediately superintending, and will be sent by him to the District Engineer with the Station books and other vouchers; and the latter Officer after verification will forward them with his countersignature, to the Inspecting Engineer.

And will be the custodian of all Public works.

Lastly. The District Engineer will exercise a general supervision over all the Public Works in the District of all kinds; whether irrigation works, roads and bridges, or Government buildings, but more especially the former two classes. Himself and by his subordinates, he will take measures to preserve them from wilful injury, to repair in due time all damage or wear and tear, and to keep the works in a full efficient condition. He will also watch for the means of improving them, and will attend to all suggestions with that object which he may receive from the Collector or from any other quarter.

He will need to be much on the march.

255. The efficient discharge of all these duties will require that the District Engineer should be much on the march, as the Civil Engineer is at present. The general oversight over the works, the preparation of estimates, the examination of work performed by his subordinates, and the due control of those subordinates in every part of their duty; all these things will require that the District Engineer should be almost constantly on the move. But having only one Collectorate to care for instead of two, and having much more efficient assistance, the District Engineer will be able to make himself much more familiar with the works under his charge than is possible for the Officers of the Civil Engineer's Department at present.

The District Engineer's estimates (with the exception above stated) his bills, and his monthly estimates of advances required, will be sent through the Inspecting Engineer of the Division, as will also his progress reports, reports of disasters to works, &c. He will also apply to him for advice or instruction on all professional matters whereon he may feel at a loss; and generally he will look to him as his immediate official superior. But on all matters connected with the execution of work, with repairs or improvements required to any works, and generally on all questions arising between himself and the revenue authorities, he will correspond with the Collector direct, as well as with subordinate officers of the Revenue Department when that course may seem expedient.

Civil Engineers now keep detailed diaries.

256. Civil Engineers and their Assistants as well as the Revenue Surveyors are now required to keep diaries, which contain all the estimates made by them respectively, with the reasons for recommending all new works or improvements, and all remarks both on the condition of works which they inspect, and on the defects and delays in the execution of works in progress. The diaries of many of the officers are very bulky; of those of the Commissioned Officers two copies are made, and three copies of those of the Revenue Surveyors, and in both cases one copy goes to the Board of Revenue in the Department of Public Works. Nor is this all; translations of them are made into the vernacular language, or more frequently into the official language, Marattah, and extracts from the translation are sent to the Tahsildars with the necessary orders by the Collector; corresponding orders, and sometimes extracts also, are likewise sent by the Collectors to the Maistries or the Maramut Superintendent; and lastly orders are issued by the Tahsildars to the village officers concerned in the works referred to.

The greater part of them may be dispensed with.

257. A great part of this mass of writing may be got rid of under the new system. In the first place all remarks on the execution of work, and instructions to the parties concerned, will be entered at once in the Station books, where they will be always at hand at the exact time and place where they are wanted, and there is no reason why they should go further. The present

circuitous mode of conveying an order, and the notification of every the slightest remark to the Presidency Controlling Board, may be necessary under the existing system, where the professional controller of the executive has no inherent authority over the agents employed in it, who are the servants of a separate department;* but at all events this necessity will certainly cease when the Executive Agents are under the efficient control of trained and competent officers on the spot.

The diaries also contain remarks on work performed; which remarks are referred to in the Board's Office, when the bill comes up. But under our proposed system, with an efficient executive, not only will there be less scope for finding fault but all such remarks will be made on the bill itself, when they will be immediately at hand; and further they will for the most part be made not by the District Engineer but by the Inspecting Engineer in his accompanying letter.

Then as to remarks upon works proposed, it is now required, and should be still, that a report shall accompany proposals for all works except repairs; but it will save trouble if this is in the form of a letter sent with the estimate, rather than of an extract from the diary.

So also all estimates for repairs will at once be sent for approval as soon as made, with a view to their immediate execution; and nothing will be gained by entering them in a diary, it will be better to have the Office copies in an Estimate book.

These various parts of the present diaries being thus otherwise provided for, a diary would be very much reduced in size. But it may still be a useful vehicle for conveying the observations of the officer on works casually seen, and matters falling under his notice; the diary will also record all the marches of the officer. These diaries should come up to the Board of Public Works and should pass under the view of both the Collector and the Inspecting Engineer. An Assistant District Engineer should keep such a diary also. It will be expedient likewise that the Sub Engineers and Overseers should keep a brief diary of their proceedings, similar to the "journal" of the Overseers in the road department; this should be sent to the District Engineer, but it does not appear to us that it need go further.

The duties of the executive officers, whether ordinary or special, will be similar to those of the District Engineers, so far as the circumstances are analogous.

258. The duties of an Inspecting Engineer in the divisions within the provinces will be as follows:

The duties of an Inspecting Engineer.

First. He will aid the District Engineers and executive officers within his division whether ordinary or special, with advice and counsel when applied to; he will also exercise a general control over their proceedings, and will be the channel of communication between them and the Board of Public Works.

Second. He will receive, and if approving will forward for sanction, estimates sent up by the District Engineer, as well as bills for works executed, both from him and from executive officers within his division: he will also control the issue of advances to the District Engineer.

Third. He will exercise inspection over works performed. But this inspection will be of a different kind from that of the Civil Engineer's Department at present; because the execution will be under trained and efficient officers. It will not be necessary therefore, it would be a waste of time, and it will be absolutely impossible, that he should measure works, or examine them very minutely. He will be able in the course of his tours to form a very correct idea of the state of the works and of the degree of efficiency of the District Engineer's Department; and where any defect appears he will take due notice of it.

Fourth. He will make annual reports on the works of his division, as noticed in para 226 of our First Report.

Fifth. He will examine and report upon projects of improvement on a large scale, either originating with himself or suggested by the Collector, the District Engineer, or other.

Sixth. It will also be an important duty of the Inspecting Engineer to ascertain and to certify to the Board of Public Works that the accounts of the District and Executive Engineers and their subordinates, are properly kept; especially that the detailed daily record of works under execution, and the cash books of the immediate Executive Agents, the only real material of

* It is now recognized that the Civil Engineers are authorized to give orders to Maistries and village officers touching works which they may be employed in executing; but an order from the Collector is required to confirm it.

the bill, are complete and authentic. The duty of examining those accounts, and of testing the bills by them will rest with the District and Executive Engineers; but we have seen that laxity is apt to creep into the keeping of these accounts, and oversight is necessary to guard against it. It will not be necessary that the Inspecting Engineer should closely examine the accounts of all works; a few taken at random, from time to time, and carefully scrutinized, will enable him to judge how far the accounts are properly kept. He will also exercise the same oversight over the accounts of the District and Executive Engineers in his Division.

He will make annual and occasional tours.

259. The duties of the Inspecting Engineer will not require him to be so constantly in the field as the District Engineer. But it will be necessary that he should make annual tours through all parts of his Division, visiting all the more considerable works, and qualifying himself to give an opinion on their condition, and upon the state of the works generally. He will also occasionally be called upon to make a journey at other times when any great work is in progress or is under investigation.

His duties as regards estimates;

In sending up estimates to the Board of Public Works, the Inspecting Engineer will report on the practicability of the Project, the probable cost, and the advantages to be expected: also as to the completeness of the estimate in providing for every part of the work, and the fairness of the rates allowed. But he will not be expected to examine the arithmetical details of the Estimate, for the correctness of which the District Engineer sending it up should be held responsible. It will be essential also that the Inspecting Engineer should not in ordinary cases be required to report on proposed works from personal inspection. If the practice of calling for this be allowed to creep in, all improvements will be indefinitely delayed; because from the very nature of the case the Inspecting Engineer cannot in general visit the various parts of his extensive Division more than once a year; and even then he could not find time to visit all proposed works, without neglecting more important duties. The only exceptions should be extensive projects involving large expenditure, and works of any peculiar character or peculiar and difficult circumstances.

And bills.

Bills need not go to the Collector at all; they will be sent by the District Engineer or Executive Officer to the Inspecting Engineer and by him to the Board of Public Works. He will report on the correctness of the charges; but he will not in this case either, be required to examine the arithmetical calculations; that examination will be left to the office of the Board of Public Works. In the case of a bill exceeding the Estimate the Inspecting Engineer will report on the sufficiency of the cause assigned.

SECTION IV.

ON THE EXECUTIVE SYSTEM IN THE MILITARY DEPARTMENT.

PART I.—THE SYSTEM DESCRIBED.

260. Having thus detailed the executive systems in the Road and the Revenue Departments, it remains that we explain that of the Military Department; and as an example and specimen of that system, we will describe exactly the practice in the Presidency Division. That is the division in which there is most work, and in which the proceedings are the most regular and systematic; it affords therefore a favourable sample of the whole. It is also that with which we have the best means of making ourselves acquainted.

The Presidency Division as a sample of the system.

The Executive Officer of the Presidency Division as explained in our First Report, is the Superintending Engineer; who has an Assistant and an Establishment, and who is under the immediate orders of the Military Board. The Superintending Engineer cannot prepare an estimate without an order from the Board; and Officers in charge of buildings needing repair, have to obtain from the Board an order to him to inspect them and prepare the necessary estimates. Even in the case of petty repairs and emergent repairs, the Superintending Engineer cannot act without special orders from the Board, who as regards the Presidency Division, inconveniently exercise the power which in other divisions has been given to the Commanding Officer.

261. As soon as an order from the Board reaches the Superintending Engineer directing him to prepare a plan and estimate for a work, it is entered in the dairy and then handed over to the plan department. A plan of the work as directed is then prepared, and is sent for the approval of the authorities connected with the proposed work; and the plan having been received back with their approval, the estimate is next prepared and is sent to the Chief Engineer with the plan, and with copy of all the correspondence. The estimate having been examined and revised by the Chief Engineer in the mode described above in Section I, is sent by him to the Military Board and that Board obtain the sanction of Government to it, and then return it for execution to the Superintending Engineer; and that officer obtains the necessary advances in the mode which will be described in Section VI, and then proceeds to execute the work.

Proceedings after an estimate has received sanction.

The foregoing description applies to new works or improvements. In the case of mere repairs there is no plan, neither does the Superintending Engineer communicate with the authorities connected with the building. And if the repair is not estimated to cost more than 500 Rupees, the estimate is sanctioned by the Military Board and is not submitted to Government.

262. All materials required in the department are supplied by contract: at present one individual has the contract to supply immediately they are called for, all materials and articles required in the department, of whatever kinds, from bricks and lime, to a hinge or half a dozen screws. The present supplier has stood in this relation to the department for about twelve years; or rather his father-in-law and himself have, for in the interval the original contractor has died and been succeeded by his son-in-law. During this term there have been a succession of contracts: the last formal engagement was for the year 1850, when the father-in-law of the present supplier entered into the usual written engagement to supply all the articles that might be required, at certain prices, which were specified in a list appended to the contract. After the expiration of this contract, the Superintending Engineer was directed by the Military Board to obtain the materials required in the manner most conducive to the public interests, but not to enter into contract.

The system of obtaining building and other materials.

or agreement with any party, without the Board's previous sanction. The course followed since that time is as follows. The same individual supplies all materials and commodities as before; but every four or six months as he may think necessary the Superintending Engineer requires him to give in a revised price list. Such a list having been given in, is put into the hands of one of the Department Maistries, with orders to go into the Town, and ascertain from the dealers what is the current price of the various commodities, and to enter such prices in the supplier's list in juxtaposition with his own prices. The list having been brought back duly filled up in this way, the whole of the rates in each of the two columns, viz: as proposed by the supplier, and as set down by the Maistry, are added up and compared; if the total amount of the supplier's rates does not exceed the total of the Maistry's rates, the Superintending Engineer is satisfied; and continues his exclusive engagement with the supplier.

The system is objectionable.

263. The system here detailed appears to us very objectionable. Even supposing all to be in good faith, the mode of comparing the two sets of prices is utterly opposed to the very elementary principles of calculation; and it is hardly possible that it should lead to a true result. The list contains articles priced by the candy (500 pounds) and by the pound, by the hundred, by the dozen and by the unit; some very costly and some of very low value. But all these discordant conditions are disregarded. A candy of hoop iron at Rupees 45, and of sheet lead at Rupees 60, are put in comparison, and on equal terms, with a pound of lamp black at nine pice, or of reeper nails at four pice; again 100 Paluirahs at Rupees 63, a dozen screws at nine pice, and a single fastening hook at five pice, are similarly compared together; and all these articles and a multitude more of equally differing quantities and rates, are blended together in one calculation. It is forgotten that an utterly insignificant increase or decrease in the rate per candy, or on a high priced article, would counterbalance an enormous difference in the rate per pound, or on a cheap article, so that any inference from a comparison so made must be utterly worthless, even on the supposition of entire good faith.

It affords facilities to fraud.

264. But it must be added that such a system affords great facilities to fraud; for it is obvious that if the prices of the articles only sparingly required are set too low by the supplier, and those of articles in constant requisition too high; the total may still be under the maistry's total, and yet a large illicit gain may be secured. Again this system trusts entirely to the report of the Maistry, and that made on information obtained or supposed to be obtained from tradespeople, without any guarantee for its truth; but we think it may well be doubted whether implicit reliance can be placed in such a case on either of these two parties.

The expediency of having a single general supplier is questionable.

Leaving entirely out of view, then, the question as to the propriety of having one general contract supplier, we object to the present system; because it entirely excludes the advantage to be gained to Government by open competition for the contract, and because the means taken to check the prices tendered by the supplier are obviously erroneous and deceptive. But we think further that even the expediency of having a general supplier at all may well be matter of enquiry. For we feel serious doubts whether an individual, (especially one like the present supplier not himself engaged in any trade,) can supply the Government immediately on demand, with the articles of a variety of trades, at cheaper rates than they could be purchased in the open market; or if that plan should be thought to have inconveniences, as no doubt it has, than they could be furnished by several contractors, each supplying the articles of his own business.

The Carpenter's yard.

265. The Superintending Engineer has a carpenter's yard, in which a stock of timber is kept, and where all carpenter's work required in the department is performed, whether roofing, flooring, doors, windows, or other. The yard is under the charge and superintendence of a European Overseer sergeant, and there is also a Conacapillay or accountant to keep the accounts. All wood work required to any building is prepared here; the cost of the timber and other articles as well as workmanship being charged against the particular work, and paid for in the manner to be detailed presently. The timber required in the yard, except that of large size, and all other materials and articles used, down to the most minute, as a pair of hinges or a few screws, are furnished by the general supplier. And all are thus obtained in the exact quantities required for each work; no stock is kept of any thing but timber. It appears to us that this system is susceptible of both improvement and simplification at once. There are a variety of articles of English manufacture, in constant use in the Superintending Engineer's Department, and generally in small quantities, such as nails and screws of various sorts and sizes, hinges, paint, oil, tar, and a

variety of others. It seems to us that such articles might be advantageously procured direct from England as tools and other things are for the Arsenal; and regular prices being put on them, might be stored, at little or no addition to the present establishment of the yard, and might be issued as required to works in progress, and charged to them in the accounts, and the amount adjusted when the bill for the work was made out.

266. The Agents employed in the immediate performance of work are maistries and conacapillays or accountants; the former to direct the workmen, and the latter to keep the accounts. There is one of each class employed on every work; but when several works of no great magnitude are near together, one conacapillay has charge of four or five; and sometimes a maistry has charge of two or three, when they are small and near together. But the number both of maistries and of conacapillays belonging to the establishment is very small, only six of the former, and eight of the latter; and of this small number four maistries and five conacapillays are permanently employed on other duty. By far the greater part of the works therefore are under the charge of "temporary" maistries and conacapillays; who, however, though called temporary, derive their sole living from the department, being temporary only in this sense, that they are paid by the day and only when they are actually employed.

The immediate executive agency.

267. As soon as a sanctioned estimate is received at the Superintending Engineer's Office, it is translated into Tamul, and placed for execution in the hands of a maistry and conacapillay. The estimate as already stated is in terms of the cubical contents of the work to be done, and does not state the quantities of materials or labour. These have to be computed from the estimate itself, which is done by known formulae.

Indents for materials.

Before commencing the work, and from time to time during its progress, the conacapillay and the maistry jointly send to the Superintendent's Office, lists of materials immediately wanted; these lists after being entered in a register, are passed on to the supplier, who forthwith furnishes the materials specified. These lists or indents are registered as already said in the Superintending Engineer's Office, and from time to time the quantities passed for each work are compared, with the estimate. This comparison would be much facilitated, if a statement similar to that in Appendix G 3, were previously made out and recorded in the same register, showing the whole quantities of materials required according to the estimate; such a list might be entered in the register, and all the successive indents might be entered below it. The comparison would then be very easy; but no such general list is made out, and the comparison of the quantities used with the whole quantities according to the estimate, is therefore much more tedious.

268. Every morning a report of every work large or small, is sent to the Superintending Engineer, showing the labour employed that day and the materials received on the preceding day. This report is prepared by the conacapillay, and is signed by himself and by the maistry; it is prepared and despatched to the Superintending Engineer's Office, as soon as work begins every morning. There is not a separate report for every work, but a separate one from every conacapillay for all the several works of which he is in charge. The report of labour is in a printed form, containing thirty-two columns with printed headings for the various sorts of labour and rates of hire, with some space blank for any kinds not specified; it contains also a column for the total amount of hire for the day. The kinds and quantities of materials received are specified on the back of the statement without any printed form. A similar report is also received every morning from the carpenter's yard in exactly the same form, specifying the workmen employed and on what works, and showing on the back the materials received from the supplier and for what work.

The daily reports received from the work.

269. All these various Reports as soon as they reach the Superintending Engineer's Office are copied into other tables, of which one is kept in the office for every work in progress, for each calendar month. These tables are styled "Morning Reports;" they are in the form of a broad sheet twenty six inches long by twenty broad; containing on one side a printed form for labour, and on the other a printed form for materials. The number of columns in the former is fifty six, besides two for remarks; every description of workmen is entered in a printed heading, and every rates of hire current in the department for each class; and as only a few of these are usually employed on any one work at the same time, five sixths of the columns are commonly blank. The printed form at the back contains fifty three columns for different descriptions or sorts of materials, with a column to show the value of those received each day. Both tables have lines and

The "Morning Reports."

dates printed for one month, with other lines below for casting up and setting down the total number or quantity of each sort of workman or material, the rate, and the total amount. Into these "Morning Reports" are posted not only the entries in the daily reports from the works to which they refer, but also those found in the carpenter's yard reports referring to the same work; so that the "Morning Reports" of a work shows the whole expenditure of labour and material upon it, whether on the spot or in the carpenter's yard.

The means of checking the daily reports.

270. The "Morning Reports" having been duly filled up for all the works in progress usually about fifty or sixty, being from 100 to 120 tables to be filled up every morning, are brought to the Superintending Engineer; and that officer then proceeds to examine and to check them. Every morning after the hour of beginning work, and every evening before the hour of leaving work, the Superintending Engineer visits some three or four or more of the works in progress, and notes in a private memorandum book the number of men employed and the quantity of work done; when he examines the "Morning Reports" of those works, he compares the number of labourers therein with his own notes. He has also three or four persons on his establishment who are employed to go the round of the works, and who render in a report every morning, of their proceedings of the preceding day, the works they visited and what they found. The men so employed are two or three of the Department Maistries as they can be spared, an East Indian who is borne on the Establishment as a conacapillay with a salary of 11 Rupees, but who is termed an Overseer, and occasionally one of the estimate makers, whose proper duty however is within the office. The Superintending Engineer receives the reports of these parties while he is examining the Morning Reports. His assistant has also a division of the works, of which he receives the reports, and which he visits from time to time as a check on those reports.

Such are the means used to check the daily reports of works in progress. Except the actual inspections by the Superintending Engineer and his Assistant, we are not disposed to set the value of the auxiliary means very high. There are also two European Overseer Sergeants belonging to the department; but one of them is in charge of the carpenter's yard, which entirely occupies him; while the other though nominally appointed to look after the works in progress within the Fort, has also the superintendence of the scavenger department in the Fort, and is required to see that every part of it is duly cleansed.

Other accounts kept at the work.

271. Besides the daily report sent to the Superintending Engineer, the conacapilly on a work has to keep several other accounts, which are all in English. First, every day as soon as work begins, he enters in a rough paper the number of workpeople of every description and rate of pay at work that day, noting the number of each class. He also keeps a nominal roll or list of all the people working under him, on all the works under his charge; this list is in a book ruled with columns one for each day for a month. From this book he prepares the acquittance rolls, on which the several classes of labourers are paid, as will be explained presently. He also keeps a list showing the denominations and rates of hire of the labourers, but not the individual names. This list is in the form of the daily report, except that only the number of columns actually required are inserted; in it he enters daily from the rough paper above mentioned, the number, description, and rate of hire of the workmen; and from this list he fills up the daily report. Accounts similar to these are kept also at the carpenter's yard, of the workpeople employed there.

Monthly "Progress Report" to the Board.

272. A "Progress Report" of the works under execution is sent to the Military Board after the close of each month. This report has eleven columns showing the various stages of a work, from its first commencement to the final submission of the bill. It fails however to give a full view of the operations of the month, because the report for each month contains, not the whole of the works in hand, but only those ordered during the month; those ordered in previous months are not brought forward. These reports are in a book, which is sent to the Military Board's Office, and returned to the Superintending Engineer after inspection. Officers in the interior send similar reports to the Board, not however in a book, but a separate report every month; those reports also contain the whole works in hand during the month.

The mode of paying the labourers

273. We have next to describe the mode of paying labourers, which differs from the modes in use in both the other Departments. Formerly labourers of all classes were paid at the end of

each month; but it was found that the common unskilled labourers were obliged to receive advances during the month from their maistry, which were repaid with large interest when the hire was paid at the end of the month. The present Superintending Engineer therefore adopted the plan of paying those classes of labourers weekly, and at diminished rates, corresponding with what the men really received formerly from the maistries. It was intended to apply this plan to all the classes of labourers, if found to succeed with those first tried; but this has not yet been done, and the bricklayers and other artizans are still paid monthly.

274. At the end of each week the conacapillay prepares from the acquittance roll above spoken of, an abstract roll or list of the common labourers employed under him during the preceding week, showing the number of labourers of each class but without names, the number of days they worked, the rate of daily hire, and the amount due, but not the separate works on which they were engaged. This roll he takes to the Superintending Engineer's Office, where in its turn with those of other works, it is examined by an accountant, and compared with the Morning Reports of the works, and being found correct is taken to the Superintending Engineer, who passes it and gives an order to the shroff to pay the amount. In the same manner similar rolls of the labourers at the carpenter's yard are prepared by the yard conacapillay, showing separately the amount due on account of every one of the numerous works large and small for which work has been done at the yard during the week; and this intricate list for acquittance roll also, having been compared with the Morning Reports and found correct, is passed for payment.

Those paid weekly.

275. The amount is paid to the yard conacapillay, and a receipt is taken from him; but much of the work done at the yard is for buildings or repairs in progress outside, and the amount of hire so chargeable is entered also in the receipts of the conacapillays of the works for which the charges were incurred respectively. Thus these earnings give receipts for money which they do not receive; and two receipts are taken from different parties for the same amounts. All this it will be evident very much complicates the naturally simple matter of paying for labour done. The conacapillays of the various works have not only to get their own accounts examined, compared with the previous reports, and passed, but if any carpenter's work has been done during the week for the work under their charge, they must wait till the yard account has been examined and passed also. Nor are all the delays over when the order for the money is obtained; on the contrary it appears to be most commonly the case that the money is not paid till the day following that on which the order is given. And thus what with having to wait his turn among 15 or 16 other conacapillays for a share of the attention of a single accountant to whom this duty belongs, the delay for the settlement of the yard account, and the delay in obtaining the money, a conacapillay has often to attend for three days at the Superintending Engineer's Office, before he can get the money due for the previous week.

Delay in getting money from the office.

276. At the end of the month the conacapillay makes out a similar abstract list of the workmen of all classes employed under him during the month, (including those who have been paid weekly,) shewing the same particulars as the weekly roll above described, and showing further the amounts already paid on weekly rolls and the remainder still due; a similar list is also prepared for the carpenter's yard. The conacapillay having prepared his list proceeds to the Superintending Engineer's Office as before, to get it examined and passed; but the causes of delay are still greater than in the case of the weekly lists, for the monthly accounts of the Superintending Engineer's own office have to be made up before the money can be got.

Those paid monthly.

The shroff keeps a book in which he enters the amount of the monthly abstract list for each work. The morning reports are totalled in the English department, and so the number of labourers of each class and at each rate is ascertained. The amounts being found to agree with the conacapillay's list, the reports are then sent to the shroff, who extracts merely the total amount for each work, and enters it in his monthly abstract book. He then takes it to the Superintending Engineer who after comparing the entries with the Morning Reports, passes the amounts for payment.

277. The shroff then deducts from the sum due to each conacapillay the amount already paid to him on weekly lists, and pays the remainder. And it must here be observed that in the office accounts as well as in the conacapillay's list (though not in his own nominal roll) the hire of the labourers is charged at the old rates formerly paid; but in point of fact the hire is paid only at the present reduced rates, the difference being deducted by the shroff in paying, and shown as

Still more delay and complication.

a saving in his accounts. And we may observe that it is the practice of the office not to enter the weekly payments of hire in the cash book. Instead of debiting those payments there at once, they are entered in another book, and at the end of the month the whole is entered in the cash book as then paid. Thus at length the conacapillay obtains his money, but after a still longer delay than on the weekly rolls, as the accounts to be examined are larger, and there are some additional ones; and it often happens that a conacapillay has to attend at the office for four or five days before he actually obtains the money due to him. We find that hire due to labourers for one month is rarely or never paid before the 15th of the following month; generally between the 15th and the 25th, but sometimes not till after the close of the second month.

Total delay.

278. The conacapillay having received the amount due on his abstract list, weekly or monthly as the case may be, pays the sums due to the several workpeople either that day or more generally the following day. Thus although the common labourers are nominally paid weekly, yet in fact their wages for one week do not generally reach them till the middle of the following week and often later; and the artisans who are paid by the month do not get their wages for one month till the 20th or 25th of the following month.

In paying the common labourers the conacapillay does not take any acknowledgment or receipt, but only himself marks the amounts in his acquittance roll as paid; in paying the artisans, some of whom can write, he takes the signatures of such, and the "marks" of the rest, in testimony that they have received their due.

The payment of the labourers is entirely left to the Conacapillays.

279. A distinctive feature in the practice of the Military Department is that the labourers are left entirely dependent on the conacapillays for the payment of their wages. The Government Officer pays the conacapillays, but there his duty ends; it is no concern of his whether the money ever reaches the labourers for whom it is disbursed. This has long been the practice, and was specially ruled by the Government in an order dated January 26th 1837, No. 177, on a petition from certain bricklayers and carpenters, complaining that wages due to them for work done on Government buildings were withheld. The Government then declared that if the conacapillays do not pay the labourers their due, the remedy of the latter is to be sought in the Small Cause Court. This system saves trouble to the Officers of the Department, but it is at the expense of the Government. At first sight it seems a hard rule as regards the labourers; but on examination it will appear that the real losers are the Government.

The Conacapillays make their own bargain with them.

280. The conacapillay being responsible is allowed to engage the people, and as the Government Officers do not interfere, he is practically left to make his own bargain with them. He is not bound to give them the full rate that is paid by the Government, and he is even allowed to some extent to fix the rates charged to the Government; for the hire of unskilled labourers only is fixed and invariable, in all the descriptions of artisans there are various rates of hire, ranging in the case of bricklayers from 4½ Annas a day to 7½, of carpenters from 3 Annas daily to 8½, and of smiths from 4 Annas to 8½ Annas. And it is left to the conacapillay to fix the rate of hire for each individual workman; the Officers of the department do not interfere. It is stated that when visiting a work the Superintending Engineer sometimes orders a man seen to be working badly to be dismissed; but he could hardly recollect the features of all, and probably even in such a case, the man is only kept out of sight for a few days, or sent to another work. In such a state of things it is obvious that a conacapillay may easily make a large profit out of the amount paid by Government as wages of labour, without ever coming to a dispute with a single workman; the men get all that they bargain for, and it is evidently for their advantage to keep on good terms with the conacapillay who gives them permanent employment.

And no doubt derive illicit advantage from them.

281. That some such system as this really prevails seems to us to need no further proof than simply to look at the circumstances of the case. The conacapillay has to keep detailed and complicated accounts, muster rolls, &c. in English, for all of which he has also to provide stationery, except that printed forms are supplied to him for the daily report; he has also considerable sums of money passing through his hands, the disbursement of which is left very much to his own discretion. And yet his pay is no more than 5½ Annas a day, being much less than that of some of the bricklayers and other workpeople employed under him. And even this small pay is not permanent, he only receives it when he is actually engaged on work, and then only for the actual working days, not for Sundays or holidays. For a full month of 26 working days he receives Rupees 8-15-0; but he is probably out of employ for parts of many months.

To suppose that under such circumstances a conacapillay would be satisfied with his small ostensible pay is directly opposed to all experience. We have already mentioned that some time ago the hire of common labour was much reduced, when the practice was adopted of paying weekly instead of monthly. The reduction in the daily pay is shewn in the table given in the margin. It was effected without any opposition or difficulty; and there seems no doubt that by a system of regular and full payment it might fairly be carried further, and be extended to the artisan classes.

	Former rate.	Present rate.	Reduction.	Per Centage reduced.
	A. P.	A. P.	Pice	
Men.....	3-0	2-6	6	16½
Boys.....	1-10	1-5	5	23
Women.....	2-2	1-9	5	15

282. We have only one other point to notice in connection with the payment of labour. When the cost of a work has exceeded the estimate it is usual to stop the excess from the amount of hire due to the labourers. It is stated that this is not done except where there is reason to

The practice of mulcting labourers when a bill exceeds the estimate.

believe that the excess is owing to the idleness of the men; but we are not satisfied that this rule is always adhered to, and even though it be, the practice appears to us to be decidedly bad. In the first place it is the Officers of the department who determine whether the idleness of the people is or is not the cause of the excess; and as it is their interest to bring the bill within the estimate, (since an excess involves the necessity of troublesome explanations at least, even if the amount is not struck off the bill,) they are too likely to infer idleness from the very fact of the excess. 2nd, the practice is bad at all events, as a check on idleness, because it only applies to cases where the estimate is exceeded. If the total cost is within that, any amount of idleness will pass unnoticed; and yet we have more than once pointed out that various circumstances affect the cost of a work, independently of the idleness or industry of the labourers. But 3rd, in point of fact the stoppage is not made from the labourers, with whom the Engineer Department has nothing to do, but from the conacapillay; and it cannot be supposed that with the means above detailed at his disposal, the latter will fail to recover the amount on some other work, or to ensure himself from such losses by a general per centage levied on wages disbursed on all works.

The practice in fact, like the similar practice in the Revenue Department, has grown out of a bad system. Where there is no trusty oversight of labour on the part of Government, such indirect check is found necessary. But where there is such efficient superintendence, a fair day's work is ensured at the time, and the labourer cannot afterwards be called to account for idleness; if there is any complaint of such a nature, the superintending party must answer it, as it was his duty either to make a man work well, or to dismiss him.

283. Another operation at the close of each month is to settle the supplier's accounts, which is done for each work separately. The materials received at each work are inserted in the daily reports as already said, and transferred to the Morning Reports. At the end of the month the entries in the latter are added together and the total of each kind and description is set down. The supplier presents his bill every month for the articles delivered in the preceding month showing separately those furnished for each work. As soon as this is received at the Superintending Engineer's Office, the quantities charged in it are first compared with those set down as received in the Morning Reports of the several works; and the quantities being found correct, the next thing is to examine the prices. For this purpose the rates charged in every item throughout the whole bill are compared in detail with those specified in the price list agreed to as above described (Para 262) by the Superintending Engineer; and the rates having been found right, or corrected where necessary, every individual calculation in the bill is then tested to ascertain the correctness of the charge. When it is added that the supplier's bill covers from fifteen to twenty pages of demy paper, and contains from 450 to 600 separate items, every one of which is subjected to the three-fold examination just detailed, it will be seen that the operation of examining it must be one of much time and labour.

The supplier's bills are settled for each month.

284. It appears from a number of bills which we have looked at, that they are usually presented for payment from the 25th to the 30th of the month following that for which they are due, though in many cases, not till the third month. A full month more generally elapses before the payment is made; and this is sometimes prolonged to three, four and even six months. And thus it is rarely less than two months, and often four, five, and even seven months, after the close of the month to which the bill refers, before it is paid. The whole value of the materials supplied during the years 1851 and 1852 was 49,275 Rupees, being something more than 2000 Rupees a month.

Long delays in their settlement.

It may be added that from the want of good forms for the accounts, the calculations of the amounts due both to the labourers and to the supplier of materials require a number of abstracts and separate calculations every month, both in the writer's and in the shroff's departments. And these being made on loose papers, and being regarded as mere rough office memoranda are not clear or easily intelligible even to the very persons who made them, after the lapse of a short time; and if at any time it is desired to test those calculations, it can only be done by the slow and laborious process of taking the original materials and making the whole of the calculations over again.

The mode of preparing the bills.

285. We have now to describe the mode of preparing the bill for work done in this Department. As soon as a building or repair is completed, a maistry of the establishment is sent to examine the work and take the measurements of every part; and his measurements so taken are compared with the sanctioned estimate. It usually happens that some deviations have been made, in the way either of addition or omission or both, generally at the suggestion of the Officer using the building; and where there are any such, however small, a list of them is made out. An application is then made to the Chief Engineer requesting him to inspect the work; the sanctioned estimate, and the list of variations accompanies the application. The Chief Engineer inspects the work, either personally or by one of his subordinates (generally the latter) and makes out a report which he sends to the Superintending Engineer; and on the receipt of that document certifying that the work has been efficiently performed, the preparation of the bill is commenced.

For labour;

286. The first step is to make an abstract or total of the whole of the labour and materials of each kind consumed on the work, which is done by adding together the entries in each column in all the successive months' Morning reports. If those reports have been duly totalled at the end of each month this is simple and easy, as the number of items to be added together is then but small. The next thing is to calculate the amount of the hire of each class of workmen employed, at each different rate of pay; this is more tedious because of the number of calculations to be made but none of them are lengthy or difficult. This completes all that is to be done as regards the cost of labour.

And for materials.

287. As regards the cost of materials the present process is more difficult and tedious. The Morning Reports show the quantities of every sort of material used; and the total quantity of each kind in each month, as ascertained after the close of the month, in order to settle the supplier's bill. When the bill for the work is to be prepared, the quantities stated in all the months' Morning Reports of the work are added together; and the next thing is to determine their cost, which is done by the same method as already described in speaking of the supplier's bills; viz. the rate for each article is separately taken from the fixed price lists, and the price of the quantity is calculated. This process is further complicated when there has been any revision and alteration in the price list during the progress of the work; as in that case the materials received during the early part of the work have to be charged for at one scale of rates, and those received during the later part at different rates. The cost of the whole of the materials used has already been elaborately determined in full detail, when the supplier's monthly bills were settled; and it does not appear why those calculations so carefully made and tested should not at once be taken in making the bill. This however is not done; the calculation is laboriously made afresh for the whole quantities, and the only use made at this stage, of the information worked out before, is testing or checking the total amount. All these processes require much time and labour and each bill occupies two or three writers for a number of days. All the above operations it must also be stated are performed upon loose papers which are not preserved, so that the correctness of the bills or their agreement with the daily accounts from which they purport to have been prepared, cannot be easily or readily ascertained at any future time, indeed not without going over the whole of the same operations afresh.

The remaining processes in the preparation.

288. The rough bills having been completed, are copied fair and laid before the Superintending Engineer who compares them with the Morning Reports and with the supplier's bills; and then numbers them, affixing the same number to all the Morning Reports and supplier's bills connected with the work.

The amount of the advances received for the work are then deducted in the bill, and the usual declaration is added at the bottom extending to thirteen lines: after this the bill is again presented to the Superintending Engineer and is signed by him. If any amount remains unexpended out of the advances received, it is sent to the Paymaster with a receipt to be signed by him; which

receipt having been received back signed, is attached to the bill and sent with it to the Chief Engineer. If on the other hand the cost of the works has exceeded the estimate, the amount of the excess is not paid to the Superintending Engineer till the bill has been passed, which is not till many months after it is sent in.

The delays in preparing the bills.

289. We have spoken of the bills as if they were prepared immediately on the completion of the work, but such is by no means the case; on the contrary there is very long delay in the preparation of the bills. At this time (the 10th May, 1853) there are in the Presidency Division alone, 450 works completed, but for which the bills have not yet been prepared; and of these works fifty two were completed in the year 1851, the earliest of them in August of that year, being a year and half ago. We have taken some pains to find out the causes of this very dilatory rate of progress, but without any very satisfactory result. The cause assigned by the department is that the establishment of the Superintending Engineer's office is too small to get through the work; and we believe this is so far true that with the present system of accounts and correspondence, the strength is not sufficient. At present the whole preparation of the bills is left to one accountant on 45 Rupees, with two assistants on 9½ Rupees and 6 Rupees a month respectively. If these men are not very skilful, as the latter two hardly could be, or very intelligent or active, as they do not appear to be, the delay may be indefinite; for if any mistake occurs in the course of a long calculation, it is not detected till the end, and then the whole must be repeated to find where the error is. It is evident to us that very much time and labour might be economized by improved forms of accounts, and better arrangements, as we shall explain presently; and we fail to see any active desire manifested or exertions used to clear off the present arrears of business.

290. As an example of the executive system of this Department we will briefly trace the course of a single work selected indiscriminately from a number of others. That which we have taken is a repair to the Gun Powder work Buildings, consequent on damage by an explosion. On the 7th March 1850, the Superintendent of the works reported to the Barrack Master that an explosion had taken place, and seriously damaged some of the Buildings, and requested that the sanction of the Military Board might be obtained for the injury to be examined and repaired; at the same time, as it was a case of urgency, he sent a copy of this letter direct to the Military Board, and requested early attention to it. The letter was sent to the Superintending Engineer by the Military Board "for immediate Report;" the order bearing the very same date as the letter. On the 11th March, the Superintending Engineer made his report of the damages sustained, and was ordered by the Board on the 12th to prepare plans and estimates for the repair.

A work taken as an example of the system.

The plan, estimates, and specification were forwarded by the Superintending Engineer to the Chief Engineer on the 23d July; and he reported to the Military Board at the same time that he had so forwarded them. In the Chief Engineer's office the documents were examined, and some trifling alterations were made in the rates, which reduced the amount of the estimate from Rupees 1,497-10-10 to Rupees 1,488-6-8; they were then transmitted to the Military Board, who obtained the sanction of Government to the outlay.

291. The sanction is dated October 1st, 1850; it was communicated by the Board to the Superintending Engineer on the 15th October, and he was at the same time authorized to draw an advance of money. After the necessary preliminary arrangements, the work was commenced on the 5th November 1850, and was completed on 20th January 1851. The work was then accurately inspected and every part measured by a maistry of the department, and a list prepared of all the variations from the sanctioned plan. And this having been done, three several reports of the completion of the work were sent by the Superintending Engineer on the 3rd February, to the Military Board, the Chief Engineer, and the Barrack Master; the first of the three being accompanied by a detailed statement of the work omitted out of that provided for in the sanctioned estimate, to the amount of Rupees 4-14-4, and of that performed though not included in the estimate, to the amount of Rupees 41-3-6. The Board sent this report to the Chief Engineer requesting him to survey the work, which he accordingly did, and sent his Survey Report to the Superintending Engineer on the 17th April 1851, certifying that the work was well done. On the 19th December 1851 the bill for the work was furnished by the Superintending Engineer to the Chief Engineer, by whom it was in due course passed on to the Military Board and by them

The progress of its execution.

to Government. It was sanctioned by Government on the 7th August 1853, but the Superintending Engineer was only informed of the fact in a letter from the Accountant General dated February 28th, 1853, after the bill had gone through the office of the Military Auditor General and been a second time examined there, in the mode to be described hereafter.

Remarks upon it; delays:

292. In this case we find promptitude of execution when the work was once commenced, in a degree which compares very favorably with the dilatory proceedings of the Revenue Department, and even with the work under the road department, as exemplified in the Palmanair Bridge; but in the other stages of the work there was much delay. The preparation of the plan and estimate for this work was not completed under four months and a half; and it required nearly three months more to obtain the sanction of Government. And yet this was a peculiarly pressing case, the necessity of the work had been strongly urged by the Superintendent of the Gunpowder Manufactory, and had been fully recognized by the Military Board; we may suppose then that the delays would have been much greater in an ordinary case. And the proceedings after the completion of the repairs were dilatory also. The Survey Report of the Chief Engineer was not obtained for nearly three months; and it took eight months more to prepare the bill. A further period of nearly eight months elapsed before the bill was sanctioned; and lastly six and a half months more, before this sanction was notified to the Superintending Engineer. So that it was two years and one month after the completion of the work, before the accounts of it were closed.

Bulkiness of the accounts.

293. And the accounts of the work were very needlessly bulky. There are fifty-four daily reports received from the conacapillay, besides the entries in forty six of those from the carpenter's yard; and the contents of these were digested into three monthly "Morning Reports" as above described. Adverting to what we have said above as to the needless size of the printed form, we may mention that in the case of this work the whole number of the places for entries in the three "Morning Reports" is 12,600, of which no less than 11,466, or above 90 per cent, are blank. Of the 57 columns in the form for report of labourers, 32 are wholly blank from the beginning to the end.

In speaking of the delay in preparing the plan and estimate for this work, and also of that in the preparation of the bill, it is fair to add that this work did not stand alone. There were two other estimates for the repair of other damages by the explosion amounting, together with this one to 7,227 Rs. and the whole three were sent up at once. And as they were all sanctioned at one time, the bills for the work done under them were also sent up together. Further, in speaking of the bulkiness of the accounts of this work, we should notice that the fifty four conacapillay's reports, and the forty six yard reports, include not merely this single work but those under the other two estimates also which were in course of execution at the same time and under charge of the same conacapillay. In reality therefore only one third of the bulk of those reports is on account of this one work.

Comparison with the Revenue and the Road Departments.

294. In closing our notice of this work as an illustration of the military executive system, it is only fair to add, that as to both the points on which we have touched, viz. the delays and the bulkiness of the accounts, this work contrasts most favorably with those which we have remarked on in the Revenue Department. The delays in almost every stage are greater there, but more particularly in executing work after it is ordered, in preparing and submitting the bill, and in obtaining the sanction of Government to it. As to the accounts of the two Departments, the difference is still greater; compared with the confused and unintelligible accounts of the Revenue Department, those of the Military Department may be called perspicuous in a very high degree, it seems unfair even to put them in comparison; and even as regards bulk the contrast is strong.

Looking at the Road Department, these accounts appear to disadvantage, being both more voluminous and less clear; in point of delays, both in executing work and in closing the accounts and submitting the bill, the Road Department has no advantage over the Military. And in making this comparison it must further be borne in mind that though much more bulky than the Road Department accounts, those of the Military Department are wholly wanting in one very important part, viz. in the detailed accounts of labour employed. It must also be remembered that the particular in which the Road Department system most eminently excels both the other executive systems, viz. the punctual and exact payment of the labourers, is one not at all brought out by a comparison of individual accounts.

PART II.—SUGGESTIONS FOR IMPROVING THE SYSTEM.

295. We will conclude our review of the executive in this department with a few general remarks and suggestions; and we will begin with the daily accounts. Their great defect is that they give no names, and thus the executive officer has no knowledge of the workpeople employed. With this exception they have the merit of recording the operations and the expenditure of each day in a distinct manner; but the forms are needlessly unwieldy and cumbrous, and the practice of having all these accounts, which are the original and real vouchers for the bill on loose pieces of paper, is inconvenient and bad. If daily reports, and their daily inspection by the Superintending Engineer be necessary at all, it would be far better, more easy both to prepare and to use afterwards, to have them in books which might be sent every morning to the Superintending Engineer's Office, and returned after being examined and initialed by that officer. This would save the necessity of copying out the whole of these bulky and numerous reports every day, as is now done. In such a book instead of having between fifty and sixty columns printed in every Report, designed to be sufficient for the whole or the greater part of all the possible entries in works of all kinds, but of which only a few occur in any one work, only the sorts of labour actually employed in each case would be given. The designations would be on the left hand side one below another, the next column would show the rates of hire, and the remainder a column for each day; and thus in a book of small size one page would suffice for half a month.

The daily accounts might be much abridged.

296. In order to illustrate our meaning, we give in Appendix J. a complete set of such accounts and reports as we intend, filled up with the actual transactions of the repair at the gunpowder manufactory on which we have been remarking. It will be seen that besides the bill there are altogether six accounts; as follow viz.

Improved forms for them in the Appendix.

1. The daily record of labourers employed at the building;
2. The same of materials received there;
3. The same of workmen employed at the Carpenter's yard on account of this work;
4. The same of materials received there for this work;
5. An abstract of the whole labour employed;
6. An abstract of the whole materials used.

It must be observed that these forms are not intended to effect, and do not involve, any change of system; they neither increase nor diminish the quantity of information supplied to the Superintending Engineer, nor do they interfere with the present mode of paying the workmen. All that they do is to present exactly the same particulars as are received at present, in a much more compendious and convenient shape, and very much to facilitate the operation of examining and testing the accounts, of paying the workmen, and of preparing the bill. We do not put them forward as suited to effect all that the department requires; but we propose them for immediate adoption as a very great improvement on the present system, and as preliminary to more decided changes to be introduced hereafter. We will briefly explain how and by whom the several accounts would be prepared, and how they would be used. The specimens will all be found in Appendix J. Nos. 1 to 7.

297. Nos. 1 and 2 are the daily reports respectively of men employed and materials received at the building itself. These should both be filled up daily by the conacapillay of the work. In statement No. 2 would be entered every evening the various materials received during the day; and No. 1 would be filled up every morning, as soon as work began, showing the numbers, descriptions, and rates, of the men engaged. This having been done, the two reports, which would

Explanation of the forms.

both be in different parts of the same book would be immediately sent to the Superintending Engineer's office; they would there be examined and initialed by that officer, and would then be returned by the same hand.

Nos. 3 and 4 are the similar statements from the carpenter's yard. It is necessary that a separate account should be kept there for each building for which work is done there; which are usually about 30 or 40 in number. For convenience sake all of these should be loosely stitched together to form a sort of book; and the whole should be sent daily to the Superintending Engineer's office to be examined and initialed. On the completion of each work the accounts at the carpenter's yard belonging to it would be taken off the book, and placed with those kept at the work itself, and so the record would be complete.

With reference to what we have already said (Paras 283 and 287) as to the labour and time now consumed in ascertaining the price of the articles furnished by the supplier, we would here observe that on every account the prices ought to be entered in the accounts of the day on which they are received. There need be no difficulty about this. The prices are always known at the Superintending Engineer's office, and the only requisite would be to furnish the conacapillays with printed lists of the articles and the prices, and to make them acquainted by the same means, with the changes of price made from time to time. Independently of the saving of time thus effected in making up the accounts, there would further be a great advantage from the publicity thus given to the prices paid in the department.

Nos. 5 and 6 are the abstracts of the foregoing daily accounts; these would be compiled in the Superintending Engineer's office. At the end of each month the several conacapillays would compute and enter the totals of all the various sorts of workmen and of materials in each of the two daily accounts for each work, as shown in the specimens 1 to 4; and would then take their books to the Engineer's Office to obtain the hire due to the labourers. The totals having been examined and found correct, the amount would be paid; and at the same time the totals both for workmen and materials would be transferred to the abstracts Nos. 5 and 6. This operation would be repeated every month that the work in question might be in progress. After its completion, the entries in the several months would be added together, and the total would be the bill. No. 7 in Appendix J. is the bill for the work, prepared in this manner from Nos. 5 and 6.

208. It is hardly necessary to point out how much these alterations in the forms of the accounts would abridge and expedite the preparation of the bill. All the intermediate processes now laboriously performed as detailed above in Paras 285 to 289, after the completion of the work would be entirely dispensed with. The cost of the materials used, which it now requires such tedious and intricate calculations to discover, would be ascertained at once, as well as the quantities, by simply adding together the totals of the proper columns of the abstracts; and the quantity and cost of the various kinds of labour, would be found with the same ease. The preparation of the bill for such a work as that to which these specimen accounts refer would occupy an accountant of ordinary skill no more than a single day; all pretence for delay in the submission of the bills would thus be obviated and there would be no arrears. The bill too would be merely a condensed statement of the facts recorded in the daily accounts; and its verification at any time by comparison with those accounts, would be direct, simple, and easy.

209. And the saving of time and labour in the Superintending Engineer's Office in other ways would be very great. The whole of the time now consumed every day in posting the entries from the hundred or hundred and fifty reports of workmen and materials from every separate work as well as from the carpenter's yard, into the numerous "morning reports" two for each work, would be got rid of. Instead of that, the daily report books would simply be examined and initialed by the Engineer. And the saving in the bulk of the accounts would not be less. Adverting to what is said above in Para 293, we estimate that fully twenty six of the large papers there spoken of may be considered as the records of the work we are considering, being equal to sixty one sheets of foolscap paper. On the other hand, the accounts of the very same work in our proposed forms, which give exactly the same information in every respect, occupy in manuscript no more than sixteen pages or four sheets of the same paper; being less than one fifteenth of the former. Again at present it is extremely difficult to find or to make use of the record of any work performed a few months back; even if the papers are all put together, which is not by any means invariably the case, they form a huge bundle of from fifty to a hundred of the large and awkward sheets above described, and it is not easy to trace out any particular wanted. In the new forms the accounts

Advantages of the new forms: In preparing the bills.

In saving time and labour in the Engineer's Office.

would be on a few small sized sheets of paper, which would be stitched together, and would contain the whole details of the work in convenient form and compass.

300. There would be similar saving of time and trouble in the paying of the labourers. The total wages of those paid weekly would be at once extracted from the account at the end of each week; and the whole might easily be got through in a few hours. At the end of the month the total of each class of workmen would be added up and brought to the office as above provided; and each day's charge having been already admitted by the Engineer, nothing would remain but to verify the totals and pay the amount; this too might probably be all got through in a single day. The present practice of first charging a fictitious rate of wages for certain classes of labourers, and afterwards substituting a lower rate and calling the difference a saving, should be abolished.

In the settling of the supplier's bills also there would be still greater saving of time, and still greater clearing away of those obstacles to the issue of money, which the servants in all offices in this country know so well how to convert to their own profit. The total quantities and prices of the materials and articles supplied during the month to each particular work, would have been already ascertained in the abstract for that work; and all that would remain to be done, to settle the supplier's account, would be to add all these totals together, an operation certainly not requiring more than an hour. The amount would be the sum due to the supplier, and should be immediately paid to him, without waiting till he presented his bill. If he should object to the correctness of any item, they might be matter for after examination, but such doubts would form no reason for holding back the whole amount due. Under such a system, the amount due every month to the supplier might certainly be paid within seven or eight days after the close of the month, instead of after a delay of from two to seven months which obtains now. And, under fair and open competition, this change could not fail to operate in lowering the prices of the articles supplied. We must repeat our opinion however that the present system of obtaining materials and tools in this department requires to be looked into.

301. In other ways also much office work in useless writing might very beneficially be saved. The order of Government of the 2nd October 1849, respecting Petty and Emergent Repairs, was not made applicable to the Presidency Division. But one practice introduced by it in the Interior, already existed there, viz. that of requiring no previous estimate in the case of emergent works, but only a statement to be sent up afterwards.

It appears to be the practice in this division, to execute all small repairs on emergency, and thus the delay and inconvenience of waiting for the previous sanction of the Military Board to an estimate are avoided; but the order above quoted not being in force with respect to the bills for such petty works, there is a separate bill for each one. Of the 221 emergent works in the year 1851 there were 146 below the amount of 50 Rupees; and of the 197 Estimates in the same year, eleven were below the same sum, making a total of 157 works under 50 Rupees each. Many of these were to a very trifling amount, several under one Rupee, and many under five Rupees; yet for every such petty work, perhaps for merely easing a Punkah or repairing a broken Venetian, money is drawn on a separate receipt, a separate record is kept of the expenditure, a separate entry is made in the journal, a separate bill is made out and submitted, and the customary declaration on honor is appended, certifying that the Superintending Engineer has derived no pecuniary advantage from the execution of the work.

302. We think that that part of the order of October 2nd 1849 which relates to these trifling works should be put in force in the Presidency Division immediately. It should be declared that all repairs supposed likely to cost less than fifty Rupees, should be called petty; that advances for such repairs should be made in the lump to the Superintending Engineer as required, at the discretion and under the orders of the Military Board, so as to avoid the necessity of separate documents for each one; and that the bills of such works should be sent up not singly but in half-yearly lists. The bills for works in the various Departments are charged to those Departments, and in order to meet this practice it would be necessary to have a separate half-yearly bill for each of the six Departments, viz. Revenue, Judicial, General, Ecclesiastical, Marine and Military. Thus there would be twelve such half-yearly bills in a year; and as the whole number of small bills in 1851 was 157, there would be a diminution of 145 bills.

In facilitating the payment of the workpeople.

And in expediting the settlement of the Supplier's bills.

Petty repairs in the Presidency Division.

The order of October 2nd, 1849 should be made applicable.

The use of printed forms would much abridge labour.

303. These changes would diminish the work and the correspondence in the Superintending Engineer's Office; but something more still might be done by improving the mode of doing business in some particulars. Many documents of frequent recurrence which are now wholly written in the office might be in printed or lithographed forms. Thus it is usual in drawing money from the Paymaster to send a separate receipt at full length for every separate advance for each work; and thus taking the number of works executed in a year at 344, which was the actual number in 1851, the whole number of receipts thus written in the course of a year is probably not less than 400, as in not a few cases there are three separate advances. Each receipt in an ordinary official hand writing occupies about one fourth of a page of foolscap, and as the receipts are prepared in duplicate, they amount in the course of the year to about 200 foolscap pages of writing; nor is this all, a full copy of every word of the receipt is kept in a book in the office as a record, and thus the whole quantity of writing on this account in the course of the year, is equal to about 300 pages of foolscap paper.

Especially in receipts for money obtained from the Paymaster.

304. The quantity of paper consumed is in fact much greater, as the two copies of each receipt occupy two half sheets of quarto post paper, and the whole quantity thus used in the year, exclusive of the office copies, is therefore 400 sheets, or above sixteen and a half quires. It is usual to send a number of these receipts to the Paymaster at once; and the simplest and most convenient course would be to have printed blank forms, with the words of acknowledgment at the top, and columns below in which to specify the amounts required, and all other necessary particulars. In such a form eight or ten receipts might be entered consecutively if necessary; and even when only one receipt was to be sent, still there would be a very great saving of trouble. And such tabular receipts we may observe would be convenient not only in the Superintending Engineer's office, but in those of the Paymaster and of the Accountant General also, as there would be only one document to refer to instead of several.

As to the office record, there is no necessity for a full copy of the receipt: a Register should be kept in the office, having columns corresponding to those of the tabular receipts, and in this the particulars of the Receipts should be entered consecutively as they occur.

The Paymasters' receipts are usually sent singly; these therefore may be in the present form, but should be printed or lithographed. The office record of these also should be in the form of a Register.

The foregoing measures ought to be carried into effect immediately.

305. All the foregoing changes may be adopted at once, and we strongly recommend that they should be so: they would save very much time and labour, and would make it quite practicable to clear off the present arrears of bills within a limited time, and to avoid all such delays for the future. They will not be acceptable among the servants of the office; for the simplification and diminution of work never is so to the generality of that class; but they are certainly good, and ought to be enforced. The complaint of the office is that the establishment is too small; but even admitting that under existing arrangements it has more work than it can well get through, yet we see so clearly that this work may be largely abridged with no diminution of efficiency, but on the contrary with material increase of it, that we do not consider any increase of that establishment to be at all necessary. On the contrary we believe that under the change of system thus proposed, it will be practicable to diminish the number of persons employed in the Office, many of them on extremely low salaries, and by augmenting the pay of the remainder, to obtain a better class of servants.

But they would not mend the defective mode of paying the labourers.

306. But though the foregoing changes would effect much in the way of simplification and the avoidance of delay, yet they would leave untouched the great defect in the system, viz. the mode of engaging and paying the workpeople, not directly on account of the department but by the Conacapillays; which leaves them entirely dependent on those persons. The books which we have proposed might easily be made available to secure improvement in this last particular also, but it is doubtful whether the department now contains fit agents for paying the people. If such there are, however, the only alterations required in the proposed daily accounts to suit them to such a change, would be to make them include the names of the workpeople employed, as well as their several classes and rates of hire. It will probably be supposed that this would very greatly increase the bulk of those accounts, but this would not be the case. On looking at the daily accounts in Appendix J. which record the progress of a work of some magnitude, it will

be seen that the instances are rare in which there are more than one labourer of the same class and at the same rate of pay; and whenever there is only one, the change in question would not in any degree increase the size of the account. Further it must be remembered that even now the Conacapillay is obliged for his own information to keep such a nominal roll of the people employed under him; and the abstract of it which he submits to the Superintending Engineer is an additional document to be prepared by him. It must be remembered further that this very practice of a daily nominal roll is actually in use in the Road department on works where tickets are not employed; and that even with it the accounts are infinitely less bulky than in the Military department.

307. But the great improvement will be to supersede entirely the present executive system and to substitute that of the Road Department, as described in a former section of this report. This would at once rectify all the great defects existing at present. It would bring in fair and direct dealing with the workpeople, and full and prompt payment of their wages, and the consequence here as elsewhere would certainly be a reduction in their rate: it would abolish the voluminous daily accounts, their daily transmission to the Superintending Engineer's Office, and their daily transcription there into the "Morning Report," and in lieu it would introduce the station books kept on the spot, and always ready for inspection and comparison with the work itself: instead of the casual visits of the Superintending Engineer or his Assistant, of little effect because those Officers exercise little interference with the labourers, there would be frequent and regular visits to all works by trained Overseers, examining work, cashing tickets, and paying acquittance rolls. The reforms which we have proposed above would effect these objects to a certain extent; and we abstain from recommending the immediate introduction of the entire Road Department system, because we are uncertain how far the existing agency is competent to work it efficiently. We are sure however that it will be well worth while to provide the necessary agency, and that which is proposed for this Division in our First Report will be quite sufficient.

The Road Department executive system should be adopted.

308. The works in the Presidency Division, though numerous, lie within a small circuit. The greater part of them, viz. almost all of those at the Presidency properly so called, are within an area of about three miles by two; the outstations of Poonamallee, Guindy, St. Thomas' Mount, and Palaveram, are all within a distance of eight miles between the farthest points; and an officer stationed at St. Thomas' Mount, (much the largest of the four places, as well as the most central,) would be only six miles from Poonamallee the most distant. The establishment proposed in our First Report for the Presidency Division comprises three Overseers; and supposing one of these to be permanently occupied in the carpenter's yard, there would be two remaining of whom one might have the Home works as above described, and the other the outstations. The works in the former are much the more numerous, but in the other they are the more scattered; but even there, they contrast most favorably with a Division of Road, in which one extremity of an Overseer's range is thirty, fifty, and even sixty miles distant from the other. Taking the average of four Statements for four different months, of works in progress at one time in the Presidency Division, we find that the whole number is 233, of which forty-one are at the outstations, and the remaining 192 in what may be called the Home circle; this seems a great disproportion, but of the last mentioned number, no fewer than 112 are within the Fort, and therefore very near together. In the Road Department it is not required that an Overseer should visit every station where work is in progress oftener than once in eight or ten days, and in the more extensive of the ranges, he cannot do it nearly so frequently: in the Presidency Division from the more compact distribution of the works, it will be quite practicable so to arrange that every work shall be visited every three or four days at least, and the labourers may be paid once a week. And this would be really a weekly payment; the men would be paid up to the very day of payment, not as at present, where the wages for one week's work are paid in the middle of the next week.

It is very suitable to the Presidency Division:

309. Thus the Road Department executive system may most easily and effectively be introduced at the Presidency; and we would not stop here, but would adopt it also at all the stations in the interior. The change will not be difficult, and it does not seem necessary to describe it in detail. The duties of the Executive Officers will vary little from what they are at present; they will still make estimates both for new works and for repairs, will arrange for their execution, and will supervise it while in progress. The chief difference will be in the mode in which they exercise that supervision. As for the immediate working of the new system, the establishments pro-

And could be easily introduced also in all the divisions.

posed in our First Report sufficiently provide for that, in giving one or more European Subordinates to each one of the Military Executive Officers both within the Frontier and beyond it. As respects the Inspecting Engineers there will be more difference. At the stations within the Frontier indeed, including Bangalore, the Inspecting Engineer will be immediately at hand; and he will exercise the same authority over the Military Executive Officers in his Division as over the Civil. But the Divisions beyond the Frontier, Nagpore, Hyderabad, the Tennesseim Provinces, and the Straits of Malacca, to each of which we proposed to assign an Executive Engineer are from their very position remote from easy visitation, and the authority of the Inspecting Engineer even where there is any, will be less immediate in those Divisions; and for that reason we recommended that the Executive Officers there should always be Engineers. This difference however in the position of the Inspecting Engineer does not at all affect the question of the Executive system. Under any system it will be the same; and we are decidedly of opinion that in those remote Divisions also that one shall be adopted, which for distinction we term the "Road Department system."

Superintending Engineers are required to give money security.

310. There are two other points which we will notice before closing our remarks on the Military executive, viz. the practice of requiring money security from executive officers, and that of Surveys of work performed.

Every Superintending Engineer is required to give security according to a scale fixing the amounts for the several Divisions: the amount is 20,000 Rupees at the Presidency, while in the other divisions it ranges from 2,000 to 7,000 Rupees. The object of this is to obtain a guarantee against loss by fraud or gross neglect, but we are of opinion that the practice is useless and objectionable. The real safeguard for the interests of the Government in this respect must be sought in the ability and integrity of the officers, and those qualities stimulated into activity by the possession of responsibility, and by the display of confidence on the part of the superior, accompanied by supervision effective without being harassing. We must declare our conviction that where those personal qualities are present the liability involved in a money security adds no guarantee; and that where they are wanting it is worthless. It cannot be doubted that in former times individual officers have made illicit gains, often in the shape of perquisites which they had accustomed themselves to think their due; and it is certain also that there have been careless and inefficient Officers in the department whose incompetency caused much loss to Government; but we are unaware of any instance of conviction, and the exaction of the penalty from the surety, for misconduct of either kind. At the present time there is no doubt that in many cases the cost of works is capable of reduction; the rates of hire and the prices of materials are higher than they need be; materials are indifferent, and workpeople are careless and idle. But no amount of money security by the Executive Officer will effect improvement in these respects; the cause of the evil is the inefficiency of the subordinate establishments, and they must be amended before it can be removed. Within a few years Officers have been formally absolved from responsibility for the extra cost of work, on the ground that it was caused by their inefficiency of establishments.

It cannot even be said that the power to furnish security proves that the officer is thought an honorable man by those who know him best; as it is generally given by friends or brother officers, and is never refused except in the most flagrant cases. Indeed it appears to us on the contrary, that the practice of requiring money security may have a directly contrary tendency, viz. may itself lead to the introduction into these appointments of men deficient in the necessary qualifications. For the authority charged with the duty of selection might silence scruples on that score by the reflection that the individual would have to give security, and that that would make up for the deficiency in his personal qualities.

The practice should be dispensed with.

311. It must be remembered also that every Commissioned Officer, at least, has of necessity a much more valuable venture depending on his right conduct than the mere amount of any money security that he may be called on to furnish. Not only his whole future prospects as regards the means of living are at stake, but his character and good name among all those on whose good estimation his happiness is most dependent. It is true instances have occurred in which officers have forfeited even all this; but can it be supposed that a man who could thus sacrifice his own dearest interests and prospects would have been restrained by the fear of incurring the loss of a few hundred pounds on some other person? The true security as already said is

and must be in the ability and high character of the officers: and we deprecate any practice which obscures that fact, which substitutes a fictitious ground of confidence, and which tends to lessen the care in selecting men for the employment at first, and to slacken the due oversight of them afterwards. Security has never been demanded of the Executive officers in the Road department, and the work in that department, as we have already stated, has not been equalled in any department for goodness and cheapness. The same means which produced that result, viz. an efficient executive, trusted to act but yet under control, ought in our opinion to be relied on universally.

312. Further we may observe that since the abolition of the appointment of Superintending Engineer in the Military Divisions within the Frontier, in 1838, and the transfers of their duties to the Staff officers of stations, all the work in this Department in those Divisions, being nearly one third of the whole, has been conducted by officers who have not given security. Again in some cases officers of the Civil Engineer's Department have been employed to execute work under the Military Board, but those officers also are exempted from giving security under a special order passed by Government in November 1836. The only instances since 1838, of security being required of officers engaged under the Military Board within the Frontier, are those of the Engineers charged with the erection of the new European barracks at Bellary and on the Neilgherry Hills.

Among all the numerous officers thus engaged during this long period in executing works without money security, most of whom fell into the discharge of those duties from the accident of their holding other duties, and were not specially selected for the duty, or had any aptitude or preparation for it, no instance has occurred in which the absence of the security has been felt as an evil or an inconvenience. This fact appears to us worthy of remark, as a practical argument to show negatively the inutility of subjecting officers to the demand of this kind of security.

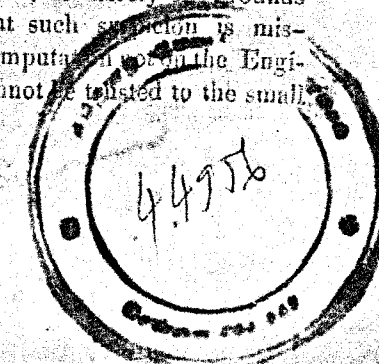
313. All works whatever in the Military Department require to be certified before the bill can be prepared; but the practice differs somewhat at the Presidency and in the Interior. We will first speak of the latter. At the Stations in the Interior repairs require to be examined after completion and certified to be properly done and in accordance with the estimate; but new buildings require to be inspected and certified four times in the course of their construction. The first of these inspections is when the foundations are dug, the second when they are laid, the third when the building is ready to receive the roof, and the fourth when the work is completed. Formerly whole of these inspections were made by Committees of the officers of the Station. At the first two stages they only certified the facts of the depth and breadth of the work; but at the last two these Survey Committees, thus taken at random, were required to certify the quality of the materials, and "to report in the fullest manner their opinion of the work," though they were most commonly wholly incompetent to form any real opinion as to the quality of either the materials or the workmanship. These Committee reports being thus of no value, while at the same time they could not but have the effect of relieving the executive officer from his proper responsibility, the system was altered some years ago; and at present Committees are not assembled, but the Commanding Officer of the Station views the work at the same stages and gives a Certificate simply of the progress made. He also gives a completion Certificate, but with less detail than the former "Completion reports," and merely certifying that the work has been in his opinion executed to the full extent of the estimate, and of good materials.

314. This change was certainly an improvement, because to a great extent, though not entirely, it got rid of the absurdity of setting officers totally incompetent to the duty, to vouch for the goodness of the Engineer's work, as if merely to relieve him of his proper responsibility; but we think even the present practice requires amendment. The certificates of the Commanding Officers are of two kinds: those relating to the progress of the work only certify simple facts, viz. that the foundation is of a certain depth and breadth, and that the walls are of a certain height; but the completion Certificate goes further, and pronounces an opinion as to the quality of the materials. Now as to the former, we think they should be discontinued entirely. We are opposed to all such petty suspicion as is implied in this perpetual interference in minute details; it is the very opposite of that confidence with which, if merely on grounds of policy, officers ought to be treated. And we are persuaded that such suspicion is misplaced, and that thus constantly to make a display of it is an undeserved imputation on the Engineer corps only, but on the whole army. If the Executive Engineers cannot be trusted to the small

Very many Executive officers in the Military Department do not give security.

Survey reports and Certificates on Buildings.

The present minute inquiry is unnecessary and injurious.



extent to which we thus propose to trust them, we hardly know what body could; but we are sure that they may and ought to be; and it is inconsistent and absurd that while an Assistant to a Civil Engineer or to the Superintendent of Roads is placed out in the Country, and left to make his own arrangements for purchasing and providing materials, and taking all other steps, for the construction of a work to cost 20,000 Rupees or perhaps half a lack, his brother officer, probably of much longer experience and in the receipt of much larger emoluments, who happens to be a Superintending Engineer in a Military Division,* is not thought fit to be trusted to dig the foundation of a cook room or a place of arms without being closely watched, though the whole cost of the building will not exceed 400 or 500 Rupees.

Mode of inspection proposed instead.

315. We propose then that this minute and inquisitorial inspection shall entirely cease; and the constitution of the office of Inspecting Engineer will do away with all pretence for this clumsy and fallacious substitute for a real inspection. It will not indeed be the duty of the Inspecting Engineer to exercise the minute and jealous scrutiny into the proceedings of the Executive Engineers which has hitherto been practised; but in Military works as in all others, he will in his annual tours look at all considerable buildings, especially all such as have been constructed, altered, or repaired, since his last visit: and this professional view, which will be careful and minute in proportion to the magnitude of the work, aided by his observation of the general aspect of matters in each District or Station, will enable the Inspecting Engineer not only to judge of the quality of the work done in each case, but also to form a very good opinion of the character of the executive management generally, and of the points on which amendment is required. And this oversight and inspection by a professional officer, special in the case of the more important works, and general in that of minor and more ordinary works, will, we feel confident, be of far more real value than the present detailed surveys. In the case of the Divisions of Hyderabad and Nagpoor, the Inspecting Engineer will be at a distance; but even there he will be able to make circuits from time to time, and thus to examine large works. And in consideration of their more remote and independent position, we have recommended that the Executive officers of those Divisions shall always be members of the Engineer corps, and be officers of some standing.

The practice in the Presidency Division.

316. In the Presidency Division the practice as to the inspection of work is different from that above described as existing at the stations in the Interior. In the first place all work done on contract, which however is but a small proportion of the whole, is inspected by the Superintending Engineer himself, who is the Executive Engineer for all other work. As respects such other work, viz. five-sixths of all the work done in the division, the Regulations require that all ordinary repairs shall be surveyed and reported on by the Chief Engineer; and that repairs of magnitude and all new works shall be surveyed on completion by a committee of the Military Board.† The inspections at the several stages of progress of new works are not required at the Presidency; and it is the more strange therefore that they should be thought necessary at other stations.

In point of fact the whole inspection at the Presidency is left to the Chief Engineer; for in all cases which under the rules require a Committee of the Board, he is constituted the Committee. This custom, though it may be regarded as an evasion of the rule, is decidedly an improvement upon it; for not to speak of the inconvenience of a number of persons assembling for such a duty, it is to be observed that with the single exception of the Chief Engineer the members of the Board are usually no better qualified to judge of the merits of building materials or workmanship, than the upcountry Committees already described.

Its inconveniences: changes recommended.

317. But even the present practice has serious inconveniences. The Chief Engineer is quite unable to visit all the works, and it would be enormous waste of his highly paid time to require him to do so; in the case of all but the largest works, therefore, or of those needing special attention from any cause, he deposes either his assistant or a maistry of his office, to make the inspection; and most frequently the latter of the two. Thus a young officer, or a native maistry as the case may be, is made an Inspector over the Superintending Engineer and set to criticize his work. This improper and objectionable state of things has resulted from the petty jealousy or the

* Superintending Engineers in this Presidency as already mentioned, are almost exclusively merely Executive Officers.

† At the outstations of St. Thomas' Mount, Poonamallee, and Palaveram, work is inspected by the Commanding Officers of those stations respectively.

pedantic formality of requiring that every work however trifling should be subjected to the form of an inspection by a member of a distinct department. It will be got rid of by recognizing that an officer confided in so largely as the Engineer is and must be, who designs, estimates for, and executes the works of the Presidency Division, may also be trusted for the goodness of his work within certain limits, without close and minute inspection. In other words, we propose that the duties of the Inspecting Engineer of the Presidency Division, to be constituted under the scheme set forth in our First Report, shall be similar to those above spoken of for the Inspecting Engineers in the Interior; and that works of inferior importance and ordinary character, shall not need special inspection.

SECTION V.

THE BILLS IN THE DEPARTMENT OF PUBLIC WORKS.

PART I.—THE FORMS OF THE BILLS.

Division of the subject.

318. The next part of the subject which we have to consider is the bills for work performed in the Public Works Department. And in dealing with them we shall observe the following order. First; we shall speak of the forms of the bills, and the mode in which they are sent up to the controlling authorities. Second: we shall detail the manner in which they are examined and audited in the several branches of the Department. Third; we shall describe the power vested in the several authorities to sanction bills; and Fourth; we shall investigate the delays occurring in the preparation and the submission of bills, and in auditing them and adjusting the advances.

Under each of these heads we shall detail the changes which appear to us to be expedient.

Two general forms for bills.

319. In speaking of the Estimates we remarked that the general form of the estimate is the same in all three branches of the Department; viz. that in all three it expresses the cubical quantities of the various parts of the building or work required, with the probable cost of each cubic yard or in some cases cubic foot. In the case of the bills the same uniformity is not found. In the Military Department and in the Road Department the bill states the quantity of each kind of labour and of materials consumed in the work, the various rates of wages and price, and the quantities at each rate, and lastly the total cost of each such quantity; the aggregate of which last forms the proper amount of the bill. In the Revenue Department the bill does not give those particulars at all; but it shows or professes to show the total cubical contents and cost of each portion or member of the work, and this compared with the quantity and price stated in the estimate for each such subdivision.

The natural and true form.

320. Of these two methods, the former is clearly in our opinion the correct and proper form for the bill; because it is the natural and true form. The object of the estimate is to describe the thing wanted; and that is a certain number of cubic feet or yards of foundation, or wall, or archwork, or stonework, or earthwork, or a certain extent of roofing or flooring, or a certain number of doors or windows of given size and form, all arranged in a certain defined order. This we say is the thing wanted, and the estimate properly describes it; but with the bill the case is different. The use of a bill is to declare the actual cost of the work when finished; and the proper mode of doing that as it appears to us, is to state all the particular units which went to make up the aggregate whole. This is the true and natural method; and the only method by which the cost of a work can be determined honestly and *bonâ fide*. In order to exhibit the cost in any other form, as for instance to show the number of cubic feet of masonry, and the cost for each foot, the before-mentioned real particulars must be subjected to various arithmetical processes, which may or may not be honestly performed, but which at all events exhibit as a result not the actual facts, but certain deductions from those facts. Now this we think objectionable and dangerous. It is true that the number of bricks used for a certain building or the number of workmen employed may be fraudulently misstated, no less than the cost of a cubic foot of brick work; but the one is a fact and the other a calculation, and we think there will be practically more backwardness to falsify in the former than in the latter.

Bills cannot be made *bonâ fide* in the Revenue Board's form.

321. In point of fact as explained at length in Section III a bill in the form required by the Board of Revenue, cannot be made *bonâ fide* from the accounts, because those accounts do not contain the necessary particulars. The bills in the Revenue Department are required to show se-

parately and distinctly the cost of each part of a work; for instance, in a building, that of the foundation, of the basement, of the steps, of the archwork of the windows, and of the walls, and this probably for every room separately. But the accounts do not show the number of labourers employed or the quantities of materials used, in such minute divisions; and they could not be made to show such detail, without a waste of time and labour much more than equivalent to any supposed advantage to be thereby attained. These details then, as shown in the bill, are not based on any actual facts, but are merely arbitrary and therefore valueless.

Thus in requiring the Executive Officer of whatever class to convert the quantities of materials and labour expended in a given piece of work, and their price, into the cubic contents of the work, and the price of a fixed quantity of such work, the Government in fact direct a tampering with the accounts, and it should not be thought surprising if the officer goes a step further and modifies his bill to suit the estimate. From our examination of the executive system in the Revenue Department as detailed in a preceding Section (Paras 189 to 195) it appears fully clear that such cooking of accounts is extensively practised. And though with the extremely vicious system of accounts in use in that Department, and the entire absence of efficient check which that system involves, similar fabrication might have been practised with bills in the other form, we cannot but think that it is much favored by the present form of the bills.

322. Nor are these the only objections to this form of bill; it must be added that the preparation of bills in this manner is extremely difficult and tedious; and further that in this form the bill affords no means of effectually checking the charges. As respects the former of these two particulars, we beg to refer to the description given above in the paras just quoted, of the actual mode of making up the bill in the Revenue Department; we may also quote the testimony which we received as to the bills for the Cheynar, Anicut and its connected works. Assistant Revenue Surveyor Bush, who superintended those works, informed us that the transformation of the charges into the shape in which they are required by the Board of Revenue, occupied him a month. He first prepared from his accounts statements of the real cost of each work in its actual terms, viz. of the quantity and cost of the various kinds of labour and materials. Under the Military Board or in the Road Department this would have sufficed, and his labour would have been ended; but to conform to the practice of the Revenue Department he had then to take the results so obtained as the material for further calculations, and to throw them into a totally different shape. This involved much labour, and after all it was done imperfectly, because Mr. Bush carried the subdivision only as far as his accounts enabled him; he did not complete it by guess as a Gomastah would have done. Further his object was simply to show the ascertained cost of the works in a new form, he did not attempt as is so often done in the Talooks, to adjust the real amounts to suit the estimate: had this been in view also, the time consumed would have been still more.

323. We say that this form of bill prevents an effectual testing of the charges, because it gives no particulars. The quantities of the several kinds of labour and of materials consumed, and the rate paid for each, are all clubbed up in a single amount. It is true that this amount, viz. the aggregate cost of a given quantity of Masonry, for instance, can be compared with the computed cost as stated in the estimate, but that is only to compare it with an average of a large number of differing particulars, and of the rates and prices of a great extent of country and even a considerable period of time. Such an average is useful and valuable in making an estimate, but it is not the proper standard of comparison for the actual charges for work performed at a given time and place. A judgment upon these can only be properly made by a comparison of particulars; and though the central authority has not the means of making such a comparison, it may be effected by active local control, and be certified by the local officers to the Board.

On the foregoing considerations we are decidedly of opinion that this form of bill is highly objectionable, as tending to the falsification of accounts, as at the best not true in all particulars, as involving much waste of time and labour in its preparation, and as not affording the means of checking the charges. We recommend that it should be abolished; and that the natural form of bill, which charges for the labour and materials actually expended, should be universally adopted.

324. One rule should be strictly adhered to, viz. that all charges should be exhibited precisely as they are incurred; that the plain fact as it took place shall be stated, without any tampering or transformation. Thus if earth work or rough stone is performed by contract or task work at so

Or without a tampering with the accounts.

Their preparation in that form is very difficult and tedious;

And bills in that form cannot be examined.

The bills should state actual facts.

much the cubic yard according to the usual method, it shall be so charged in the bill; if done by day-labour, the number of labourers at the various rates shall be charged for. Again in the case of building materials; if bricks or chunnam are obtained on contract, the bill should show the quantity, the contract rate and the cost; but if they are prepared as is so frequently found best both for economy and expedition, under the direction of officers of the Department, then the bill should show the labour employed in moulding, stacking, and moving them; the cost of fuel, or the cooly hire for cutting and bringing it, should be shown, as the case may be. In short in all cases the rule should be that the fact of the charge should be stated just as it occurred. Nor will it be found that this plan involves additional trouble, as might at first sight be supposed, on the contrary it will diminish labour, because the transforming calculations will be avoided, at the same time that it removes all plea or excuse for tampering with charges or with accounts.

The bills in the Military Department.

325. We next come to consider the particular form of the bills. It appears to us that a bill should be a bill only, that it should contain all that is necessary to a decision upon itself, and that it should contain nothing more. In the Military Department this is already the practice. The Bill states the quantities, prices, and cost of the labour and materials expended on the work, with particulars of the small outlay on sundries; and the heading specifies the work, and quotes the estimate and the sanction, general or special, under which it was undertaken. This forms the whole bill. When a number of works are charged in a single bill as in the case of petty repairs, precisely the same form is observed, the details of each work being given in succession one after another. We should add that in the case of these petty and emergent works done without estimate, the bill is accompanied by a "statement" of the work done. This however is merely a repetition of what is given in the bill, and may be dispensed with.

The declaration appended to them.

326. There is one practice as respects the bills in the Military Department, which we must specially notice. Appended to every bill is a declaration signed by the executive officer, certifying on his honour that the bill is correct, that the charges are the lowest compatible with good work, and that he himself has derived no pecuniary advantage from the execution of the work. The practice of requiring this declaration appears to be very objectionable, and we are of opinion that it ought to be discontinued. It originated very many years ago, when the very prejudicial custom existed of allowing executive officers a high commission (8 per cent) on their expenditure; it was at first on oath, but afterwards reduced to the declaration on honour. Whatever the value of such a practice formerly, we are of opinion that it is quite unnecessary now; and we would observe that such an asseveration has never been required in either of the other branches of the Public Works Department. In the Revenue Department the executive officers are the Tahsildars, who cannot be deemed worthy of implicit trust, and the control of the Collector over them in the details of the execution, is and ever must be, very little more than nominal. Yet no such guarantee for the truth of the charges has ever been required from the executive officers of that department.* In the Road Department again the executive officers are commissioned officers of precisely the same qualities and the same sense of honour as those in the Military Department, neither better nor worse; or if the Overseers who make up the bills are held to be the executive Officers they must be pronounced inferior in those qualities; yet neither in this Department has any declaration been required.

It is not required in the other two branches of the department.

It is objectionable, and should be discontinued.

327. We are of opinion that it ought to be discontinued in the Military Department also. It appears to us that the custom is not simply unnecessary, but that it is injurious. The practice formerly so common in England, of exacting oaths on numerous and trivial occasions has justly been condemned, and that now under notice appears to stand on similar ground. If it is found that the frequent and habitual invocation of even the most awful sanction operates to deaden the sense of it and so to make the act at last no more than a mere form, surely the same result will follow in the case of any sanction of an inferior character. And the consequence may be even worse; not only to make the declaration on honour a mere matter of form, but even to dull the sense of honour itself. There is something insulting too in being called on to

* It cannot be pleaded that in their case the reliance is not on their honesty, but on the after inspection by the Civil Engineer's Department for, 1st, no after inspection can ever make the integrity of the executive a matter of indifference; and certainly the inspection by the slender Civil Engineer's Department is not such as to do so. And, 2nd, The Superintending Engineer at the Presidency has his work closely inspected by superior officers, and yet is obliged to make the declaration.

pledge one's word of honour on trifling occasions, as if a simple assertion were unworthy of belief. Even in this way the practice in question must be galling to a man of nice feelings, till those feelings become blunted by the habit. We fully believe, and it would be injurious to a body of high-minded officers to think otherwise, that in the case of the vast majority of them the declaration is quite superfluous; and we believe also that in the few cases in which it is not superfluous it is inoperative. If an officer is not restrained from dishonorable practices by his general sense of honor and the fear of exposure and ruin if discovered, it is not to be believed that he would be withheld by a mere customary and formal declaration.

328. The bills in the road department are very similar to those of the Military Department, and there is very little amendment to propose in them. The only point which we have to notice in them, is that some details given in them, though utterly useless, involve a great deal of labour. We allude to the practice of exhibiting separately in the bills for road work, the quantity and cost of material deposited, and of labour employed, in every separate mile, and of material brought from every separate quarry. In speaking of the executive system in the road department in Section II we adverted to this practice, and described (paras 126, &c.) the prodigious amount of labour which it requires, and the information thus laboriously worked out is utterly useless to the controlling authority in dealing with the bill. As a matter of curiosity, such information may have a value, and possibly it may even be of use as exhibiting the cost of maintaining particular portions of the road; though even for that purpose so great a degree of minuteness is unnecessary. For all the purposes of a bill, at all events, this detail is utterly useless; while it occasions great delay in the preparation and submission of the bills. We are of opinion therefore that such details should be omitted from the bill; we give in Appendix H 9 a simple form of bill for road work, we have explained already (Para 146) how easily it will be prepared from the books which we propose that an Overseer should keep.

The bills of the road department.

329. The bill in the Revenue Department is a totally different document from those of the two other Departments. Not only is its general form quite dissimilar, as above described, but it differs in various other particulars. In the Military and Road Departments each bill is a distinct document showing the elementary and actual facts of the cost of the work: in the Revenue Department the paper called a bill is in fact a long comparative statement or list of works performed and their cost, but without any particulars of the real cost of the work and with very few details of any kind. In the former two Departments a bill is a bill and nothing else; in the Revenue Department as we have already noticed to be the case also with the estimates, the bill is made to show various matters which have nothing to do with the work performed. We will briefly describe the several forms in use in this department.

The bills of the Revenue Department.

By far the most numerous class of works are the ordinary repairs to works of irrigation. The bills for these works came up to the Board in a single annual list from each district. In these lists the charges are only given in abstract. Each work occupies a single line in the statement; or where it is composed of several distinct parts, a separate line for each such part, as for example in the case of a tank, one line for the repair of the bank, another for the calingulah, a third for the sluice, and so on. The only information given as to the work performed whether it was done by piece work or by daily labour, is the total cubical quantity, whether earthwork, rough stone, masonry, &c. the cost per cubic yard or foot, and the total cost.

For ordinary repairs.

330. The submission of the ordinary estimates for sanction has been recently discontinued, as being quite useless for any practical purpose; and the form of the bill which was already very large, has been still further amplified in order to include some particulars formerly given in the list of estimates. The new form contains 36 columns of which no more than nine have any immediate reference to the work performed; and though written rather more closely than it would be in actual use; it measures above two feet and a half in breadth from right to left. In this statement every separate ordinary work performed in a whole district during the year to which it refers is entered. It is of course a very unwieldy and cumbersome document. The Tanjore list of ordinary bills for 1848, (which was in no degree an exceptional year,) contained no fewer than 1003; the list "or bill" as it is called, fills sixty sheets or two and a half quires, of demy paper, and in the new form would certainly occupy one fifth more, or three quires. Its length from left to right is now 2 feet 4 inches, and in the new form would not be less than three feet. Such a document must needs be most inconvenient to handle or examine.

Their inconvenient form.

They contain various useless details;

331. Of the many details given in these "bills" but not at all pertaining to the work done, and therefore having no proper place there, some need not be reported at all, while the rest would be so more conveniently in another shape. The new form contains a number of columns intended to show the details of the estimate for each individual work; but this appears to us to be quite superfluous. The Collector is empowered to authorize without previous special sanction, the common repairs necessary for the preservation and maintenance of the works of irrigation; and having laid out a certain sum on each work, he sends in the statement of outlay; it does not appear how at this stage of the proceedings, a knowledge of the amount of the estimate can in any way assist the Board to judge of the propriety of the expenditure. The use of an estimate prior to the execution of the work is great, both to guide the executive, and to inform the controlling authorities of the probable amount of the outlay; but the work having been done, and approved by the Inspecting Department, it is of no consequence whether a little less or more was done than the estimate intended, or at rates a little cheaper or dearer than there allowed. Whatever care may be displayed in framing an estimate, it may safely be said that with a good executive more is exhibited in the execution of the work; and then also the real difficulty or easiness of the work can best be known. Any deviation therefore from the estimate in the execution, is likely to be towards the side of truth and fact. The thing in view is to repair the work efficiently; and if that is done, it seems needless afterwards to recur to the estimate to see what was supposed to be necessary when it was made. And it will be still less necessary under the proposed organization of the Department when both the estimate and the bill will have received the guarantee of the confirmation of a professional officer unconnected either with the Revenue Department or with the executive. The desire of thus comparing the bill with the estimate owes its origin to that erroneous practice of looking on the estimate as a standard, to which we shall have to advert presently. As respects those estimates of which the execution was only partially completed, or not even begun, it seems still less necessary to any purpose of an effective control that such details should be communicated to the Board. But even admitting that it is expedient that the Board should be informed of them, they surely have no proper place in a bill for work done; they would more properly find a place in the annual report. The exclusion from the bills of all references to the estimate would at once sweep away thirteen of the thirty six columns which the form now contains.

And matters out of place in a bill.

332. Towards the end of the form there are nine other columns (26 to 34) which are also out of place in a bill for work. All these are intended to afford the means of judging whether the work was undertaken in accordance with the prescribed rule. The first is to show the necessity of the repair, the second the amount expended on the same tank or channel in the preceding five years; the next six show the ordinary cultivation and revenue, in order to enable the Board to apply the rule which excludes repairs exceeding one year's revenue from the ordinary list; the last is to show the expected increase of revenue by means of the repair. Now with respect to all these it occurs to remark that the bill is not a fit place to discuss these points. The work having been done, and done under competent authority must be paid for; the bill is sent in to obtain sanction for such adjustment; and to mix up this question with others of a different nature can only impede business. Such other matters so far as they need to be reported at all, may properly be included in the annual report. It seems indeed superfluous in a case of ordinary repair to require that the particular necessity of the work should be specified in each case, as that necessity will in almost every instance be the same, viz. it will be the result of the ordinary deteriorating causes; and as to the expected increase, it seems needless also to state that, as the object of the ordinary repairs is to maintain and not at all to augment the revenue. As regards the other particulars, designed to ensure obedience to the rules limiting expenditure on this species of work, it appears to us that this is not the proper mode of enforcing those rules. The limit is that the amount expended shall not bear more than a certain proportion to the revenue derived from the work; it seems to us that it should be left to the Collector and the Inspecting Engineer to carry out this rule, notifying to the Board the special cases if any in which it is thought expedient to break through it. This and other matters, including notice of cases in which large or frequent outlay is incurred on any particular work, will properly have a place in the annual Reports of the Collector and the Inspecting Engineer.

The practice of sending up the ordinary bills in

333. As to the practice of sending up all the ordinary bills of the year for a whole district at once, nothing appears to be gained by it, while it is the occasion of some practical evil. It causes no small delay in the submission of the bills; for none can be sent up till the whole are

completed, and it often happens that the great mass are detained for months, on account of one or two individual bills prevented by some special cause from being drawn up. In almost all the districts the greater part of the ordinary repairs are completed by the end of August, and nearly the whole before the commencement of the monsoon in October. Yet even the time fixed by the Board for the submission of the bills is the 31st July of the following year; and in point of fact they are not generally submitted till several months later, sometimes not till the commencement of the third year. A second inconvenience is that already mentioned, the awkward and unwieldy size of the document. As to the advantages of the present plan, Captain Bell has expressed to us the opinion that it saves trouble in his office to have all the bills of a district together; but on the other hand it is the practice in the office of the Military Board, to examine and send up their bills, which are also numerous singly or in small batches as soon as they come in, without waiting to collect all those for any station; and the acting Secretary strongly advocates that plan, and is in favor of its being still more strictly adhered to, on the ground that it greatly facilitates the business of the office.

It appears to us after careful enquiry and consideration, that this is the correct opinion; and that in addition to delay in sending up the bills from the districts, the present practice of the Revenue Department, causes delay in their examination and submission to Government. It must also be remembered that the bills in the last mentioned department, from being only sent up in abstract, do not receive and are not capable of receiving, more than a very slight examination; while in the Military Department the bills are accurately and minutely scrutinized.

334. The bills for "occasional" work, comprehending all improvements to irrigation works, and work of all kinds to roads and to buildings, except the most trifling repairs, are in a similar form to the "ordinary" bills, though not precisely the same. The form does not contain so many columns, but it has many particulars which are out of place in a bill, and it is in the shape of a list for a number of bills. The details required to be shown correspond exactly with those of the estimate, and parallel columns show in comparison throughout, both the dimensions and the cost of each part of the work, as estimated and as performed and charged. We have already explained that this division of the cost cannot be bona fide, and in point of fact never is so; but even in the most favourable view, is a mere factitious and arbitrary subdivision of the aggregate charge, to agree with the details of the estimate. We have recommended that this subdivision should be discontinued as worse than useless; and with it the so called comparison with the details of the estimate will cease also, and there will be no necessity to exhibit any portion of the estimate in the bill except the total amount. The form also includes six columns intended to show what proportion of the work estimated has been executed, which seem quite superfluous. Being intended for a long list of bills, this form also contains a column for explanation as to the variation between the total amount of the estimate and of the bill, and for recording the name of the Officer who inspected each work. These also appear to us to be needless. We are decidedly of opinion that as a general rule each bill should come in as a separate document. In point of fact even at present the "occasional" bills do come in so for the most part, and it appears to us the most convenient plan that they should do so; the most convenient for expedition in the submission of bills, and the most convenient for their easy and rapid consideration by the controlling authorities. This plan will render needless both this column, and those for showing the Talook and Village; as the latter particulars will be given in the heading, and the others at foot. The bills for emergent works are the same in their general form as the foregoing, and the same remarks apply to them; it is unnecessary to describe them in detail.

Bills for occasional work.

These also should be sent up singly.

335. It may at first be thought, perhaps, that the great number of the bills in the Revenue Department would make it inconvenient or impossible to deal with them all separately. We will therefore briefly state the number of bills in that Department in comparison with that in the Military Department. The total number of "ordinary" bills sent up to the Board of Revenue in 1850 was 3,598, to the aggregate amount of 539,125 Rupees. But many of them were for very trifling amounts, and it appears to us proper, following the analogy of the Military Department that the bills for all mere repairs to works of all kinds not exceeding 100 Rupees in amount, should be dealt with as those for petty repairs in that department are now, viz. that they should be sent up periodically in a single bill from each executive officer.

This might be done without difficulty.

66

Comparison with the number in the Military Department.

335. Taking the year 1850, we find that there were only 1295 ordinary bills exceeding 100 Rupees each; of the class called emergent repairs to irrigation works there were 147 bills above 100 Rupees, making a total of 1442. For emergent repairs to buildings there were in the same year 522 bills, of which only 78 were above 100 Rupees each; and for works done on estimate to buildings and roads, there were 659; of which 208 were above 100 Rupees, and it may safely be assumed that all below that amount were for mere repairs. Besides the above there were also 404 bills for improvements and additions to works of irrigation, all of which not being for repairs, should come up singly. Thus in 1850 the total number of all bills to come up singly under the rule just proposed was 1832. And supposing bills under 100 Rupees to be sent up monthly they would probably amount to about 200 in a year, as in some Districts there would be none at certain seasons; and thus the total number of bills to come up in the course of the year, taking 1850 as a standard would be a little more than 2,000. This is a large number to deal with certainly; but it is not altogether unmanageable. The number of bills in the Military Department though very much smaller, is not so much so as to make comparison and inference impossible. We find that in the Official year 1849-50, the total number of bills disposed of by the Military Board was 755; all of which, according to the practice at that time, came up as separate bills. And the whole of them were tested in the Chief Engineer's office, and examined and passed by the Military Board, as fast as they individually came in, without inconvenience or delay. And though they are much fewer than those in the Revenue Department it must be remembered also that the "Engineer Department" of the Military Board's Office is very limited and comprises but a small part of the work of the office; whereas in the Revenue Department, there is a Secretary and Establishment for this sole work, and we contemplate ultimately a separate Board and office for the Public Works Department.

And it is necessary to an effectual audit.

337. It must be remembered further that if the central office is to exercise any efficient control over the expenditure, the bills must be subjected to examination, and must come up in such a form as to be susceptible of examination; and the question therefore is not whether the work is much or little, but how it can best be done. And it is our firm conviction that the most effectual, and at the same time the most expeditious mode of doing it, will be to have the bills up in the form and manner which we now propose. The document hitherto called a bill in the Revenue Department, especially, as regards the "ordinary" repairs, cannot properly be described as a bill at all. It is a mere list of work done, giving scarcely any details of the work or its cost, but giving a variety of other particulars in no way related to the work; and the attention of the central office has hitherto been directed more to those other particulars than to the consideration whether the charges in the bill are fair and proper.

We recommend therefore that all bills for new works and improvements to any amount, and all bills for repairs to any class of works exceeding 100 Rupees each, shall come up to the controlling Board separately; but that all mere repairs to works of any kind, not exceeding in each case 100 Rupees shall be charged in monthly or quarterly bills.

Remarks on the proposed forms for bills.

338. We give specimens in the Appendix, of bills in the form which we advocate, drawn up in accordance with the foregoing remarks. Appendix K is a bill for road work. It contains the actual charges for the work done in the 1st Division of No. 1 trunk road, in the half year ending October 31, 1852. In speaking of the executive system of the Road Department we have already described (Paras 120 &c.) the minute detail now exhibited in the bills of that department; and the laborious operations necessary to that end; and in Paras 152 &c. we have described the simple form of bill which we would substitute. We have also there adverted to the fact that the bills for work in the Road Department contain many items which have no proper place there. Under the head of "sundries," the original of our specimen bill contains very large charges for contingencies and the purchase of tools; the whole of which we have excluded, with the exception of some charges properly coming under the term "sundries," and evidently incurred for the very work included in the bill. The original bill also contained a charge of above 1,500 Rupees, for the salaries of that part of the fixed establishment of the department which is employed on this road. We have excluded that charge also for the reasons already stated.* We need not add

* We will fortify our own opinion of the inconvenience and danger of the practice of distributing the salaries of establishments over particular estimates, by a quotation from a report on the fixed establishments of Ceylon, to which more particular reference will be made presently. The Committee speak as follows.

any thing more as to the form and contents of this bill, but we may notice the heading. The particulars given in it are intended to specify the work accurately and to connect it with the estimate under which the work was done. The department to which the amount is to be charged, and the species of work viz. whether new work or repair, are also noted, in order to guide the office of account in debiting the charge. The various component parts of the heading are arranged in the order which seems the most clear and immediately intelligible.

Appendix J 7 is a specimen bill for building. It is filled up with the actual facts of the work performed to the powder mill buildings, spoken of in part I of Section II; and agrees with the detailed accounts given in the other numbers of Appendix J, as specimens of the forms of daily and other accounts recommended by us. This bill needs few remarks. It differs very little from the form already in use in the Military Department; the principal difference being that the "sundries" are given with somewhat less minute detail. The heading of this bill is similar to that of the one last remarked on. The declaration heretofore appended to bills in the Military Department, is omitted for the reasons stated above.

We would have given also a model bill for work in the Irrigation department, but we could not without difficulty have obtained the necessary materials for constructing such a bill, as the actual bills in the department do not afford them. The two specimens thus given, however, sufficiently explain our intention as to the form of bills for work of all kinds.

339. There is a question connected with the form of bills on which we ought to give an opinion, and that is whether periodical bills should be sent in at fixed periods during the progress of a work, or only a single bill after its completion. The practice in this respect has not been quite uniform, but the submission of completed bills only has been by far the most general. Under the Board of Revenue the practice till recently varied in the several Districts; from some the bills for occasional works were closed up to the end of each year, while from others no bill came in till the work was completed. In 1850 the Government noticed this circumstance, and desired that one course or the other should be made general. The Board then considered the question, and came to the resolution that the best course would be to get in no bills for any part of a work till its completion; and this view was sanctioned by the Government. Under the Military Board the practice has been to send in bills for completed works only. In the Road Department the bills are made up by the immediate executive officers for every six months, and sent to the office of the Superintendent, where it seems to have been the practice till recently to detain them till all the bills for work under each estimate were ready, and then to send up to Government at once all the

Periodical settlements.

"But this is not all; in the confusion of accounts in this Department there is a still further and more extraordinary anomaly to come. It would naturally be concluded that the first four divisions of pioneers, those namely who are borne on the schedules of the fixed establishment, would not be charged on the estimates of individual works, but that only the remaining four divisions who are not so borne would be charged and paid in this manner. Such, however, is not the case. In point of fact, the whole eight divisions of pioneers, fixed and unfixed, are equally charged against the separate estimates; in other words, the schedule of establishment is a pure fiction and offers no criterion whatever of the amount of its annual expense.

"Besides the excess in the number of divisions of pioneers there is also a staff of European superintendents, varying in number, but at present amounting to 14, at different rates of pay, of which the average is 7s. 6d. per diem, scattered over the island, whose salaries and allowances are charged in like manner against the individual estimate, and who are in like manner often shifted about from one station to another, not because their services are required, but to make the different estimates fit in and cover the charge of their pay. So, while the cost of the establishment of the Commissioner of Roads for the current year is given in the estimates, as above stated, at 16,016£ 13s. 4d., and the estimate for actual outlay on roads, streets, and bridges is 43,573£, we find the latter amount entered in the summary of the estimates at only 33,418£, the difference between the two amounts being the supposed aggregate of the expenditure brought to account under two different heads. We say the supposed aggregate, for the fact is, that the whole amount is a fictitious one altogether, and the system so bad that no ingenuity can bring it into light and order without a complete and radical change. For in this attempt at adjustment it is, we presume, only the expenditure of the fixed divisions of pioneers which is subtracted from the whole amount; though what reason there can be for making any distinction whatever, in this or any other respect, between the two classes, or why the pay of certain officers of the department should be brought to account as a distinct charge on every work performed by it, any more than a proportion of the salaries of the Government agents, for example, and their establishments, should be brought to account in, and subtracted from, every payment of revenue made into their hands, we are wholly at a loss to imagine."

bills for each estimate. And even in cases where this has not been done, the delays in sending up the bills to Government have been so considerable, that they cannot be said to have been submitted periodically.

Examples of the inconvenience of bills for completed works only.

340. In considering this question we have been forcibly struck with the inconvenience of the system of receiving completed bills only, as exhibited in the case of the Godavery Anicut and the works connected with it. Those works were commenced early in 1847, and have been in progress six years and a half; the amount advanced for their execution, up to the end of April 1853 exceeds sixteen lacks of rupees. With the exception of a small sum of about 14,000 Rupees for work done on two small subsidiary estimates, no part of this large expenditure was audited and sanctioned till March 1853, above six years after the first advances were made. On the 24th of that month, two bills for the construction of the anicut, to the aggregate amount of nearly nine and a quarter lacks of rupees, received the sanction of Government viz. one of 9,09,831 Rs. for the Anicut itself, and one of 12,330 Rupees, for some additional work to it on a separate estimate. The large remaining sum amounting to nearly seven lacks is still entirely unaccounted for; it has been expended on a multitude of works of different kinds, some of which have been completed a long time, while others are still in progress. With simple accounts, and monthly or quarterly settlements, all these multifarious operations would have been kept clear and intelligible, and the exact expenditure on every work would have been known; under the actual system confusion is unavoidable, and probably no accurate account of this outlay will ever be obtained.

And the same objectionable result must occur in the case of all large works whether roads, ghauts, irrigation works or buildings, which occupy several years in execution. Thus the Perambaddy ghaut was commenced in February 1848 on an estimate to the amount of 1,83,376 Rupees, and occupied about three and a half years in execution, having been completed in the middle of 1851. But no part of the expenditure on this work was submitted for the sanction of Government till the 7th June 1852, on which date the Superintendent of Roads forwarded to Government a bill for the charges incurred up to the 30th June 1851. This bill was sanctioned by Government on the 6th July 1852, being four years and a half after the commencement of the work. Again the road in Tinnevely District from Streevellapootoor to Tuticorin, now in course of execution on an estimate of 1,00,463 Rupees, was begun near the close of 1850, above two years and a half ago; it is expected to be completed in 1855, and under the existing system the whole advances for the work will remain outstanding for this long period, and till the bill for the whole can be completed, sent in and sanctioned. And thus most probably no bill will be audited or passed for any part of the expenditure, or the accounts of any portion of it be closed, till at least seven years after the work was commenced.

Periodical settlements would involve no inconvenience.

341. The Board of Revenue were induced to pronounce against periodical bills, by the opinion that they would cause increased trouble in their office as well as in the offices of the Collectors. They admitted that this course would expedite the adjustment of advances, but they did not estimate that advantage very highly; and they observed that to make the opposite practice universal would not materially augment the amount of advances outstanding, in as much as it obtained already in all but a few Districts. They painted in strong colours the inconvenience of several bills coming in for successive portions of one small work, each costing as much time and labour as a single bill for the whole would have done: and it is certain that this evil would be at its maximum under the present system of executing work. For so dilatory are the executive arrangements, that the completion of even small works is often protracted through the whole of the two years for which occasional estimates are current; indeed the Board speak of still longer delay, and describe the working of the system to be to bring "the entire subject" of an insignificant work under review three or four times, by the same number of annual bills. It appears to us that the Board make much more of this difficulty or inconvenience than it is really worth, even under the present very defective executive arrangements; and it is certain that with an efficient executive the objection would disappear. Works of small size would then rarely or never fail to be completed in a single season; and in all larger works we cannot but think it eminently desirable that the accounts should be closed, and the advances adjusted, at least at the end of each year.

Yearly settlements should be adopted; and half yearly for large works.

342. On the whole we are decidedly of opinion that a yearly submission of bills ought to be established for all works, and that in the case of large works bills ought to be submitted and settled half yearly at least, if not quarterly. With a good system of daily accounts, such as we have detailed in Section II, or even such as those which we propose provisionally in Section IV, there will be

no difficulty whatever in complying with this rule. Indeed the bills might without difficulty be made up from such accounts for every month, did there appear sufficient reason for requiring them so frequently. The yearly bills should be closed to the 30th April, the half yearly to the 31st October and 30th April, as in the Road Department; thus the accounts of the Public Works will tally with those of the other branches of the administration, which they do not at present in the Revenue Department.

For an example of the practicability of periodical bills and of their convenience, we need look no further than the Road Department, in which, as already said, they have always been made up half yearly. For further testimony of their utility we may cite the experience of the Canal officers in the North West Provinces. On those works quarterly settlements were in use from the first; and some years ago Colonel Cautley declared in one of his reports that they had been found so valuable, that he intended to carry the system further and introduce monthly settlements. We may add that monthly settlements have been adopted on the Railway works now in progress here; and that the same are universal on the English railways.

In a future part of this Report we shall have to show that not alone for the sake of punctuality in the settlement of accounts, but as an essential condition of any real examination and control of the expenditure and of the operations of the Department, it is necessary that the accounts of all works whatever in course of execution, shall be closed, and bills made out, at the end of each year.

343. Before leaving this subject it may be well to observe what a periodical settlement of accounts will effect, and what it will not. Two things are necessary to the final closing of an account of expenditure on Public Works; the passing of the accounts of the disbursements, and the inspection and approval of the work. The first determines the amount expended, the second certifies the sufficiency of the equivalent obtained for the outlay. Now this latter can seldom be exactly known till the work is done; it cannot be so well ascertained for a broken period. But though it cannot be then determined with the same accuracy as after the completion of the whole work, it can even then be ascertained approximately. For in a building the accounts will show the quantities of materials collected, as well as that of the work actually finished; and in the case of earthwork the quantity actually executed can at any time be stated with a considerable degree of precision. Periodical settlements then will prevent the undoubted evil of a large mass of outstanding advances, and so will simplify the public accounts, and this will be a great gain, both to the Government and to the Executive officers. They will also bring the examination of the accounts of those officers very near the time of the disbursement, instead of postponing it till perhaps several years after; and to a great extent the sufficiency of the work will also be ascertained with equal punctuality.

Thence of Periodical settlements.

344. There is another question, somewhat analogous to that of periodical bills; viz. when ought bills for tools, implements, and machinery required for a work, to be settled; immediately on the articles being purchased, or not till the work is finished. On the side of the former course are all the reasons in favor of speedy settlements of accounts and small outstanding advances; while it is argued in support of the opposite practice, that in cases where the outlay on implements and machinery has been large, it is necessary to determine by an examination of the result after a work is completed, whether that expenditure was judicious. We admit the propriety of such a comparison, but still we maintain that the amount of the purchase need not therefore be retained as an unadjusted advance till the completion of the work, any more than the advances for the whole work need be so retained without any intermediate adjustment. The articles have been purchased for the service of Government, and having been so they must be paid for by the Government. After the work is finished the suitability of the means used may be considered, and we think it should be specially reported on by the Inspecting Engineer; and the result of such discussion may often furnish valuable matter for future guidance. Where an injudicious expenditure shall appear to have been made, the officer will incur censure, and in the event of positive waste, or gross negligence, he may be punished by degradation; but it can never be just, and if just it would not be expedient, to make him in the amount of the loss. And even if we could suppose that such a resolution would ever be passed, it would still be quite unnecessary to keep the accounts open; to do so would not in any manner or degree facilitate the recovery of the amount, which under any circumstances could be effected only by a retrenchment against the allowances of the officer. It is our decided opinion therefore, that bills for tools, implements and

The Settlement for tools and machinery.

machinery ought to be included in the first periodical bill after their purchase. The last bill for any large work might be accompanied by a list of the tools and machinery on hand, and their value; and this amount, after being approved and verified by the Inspecting Engineer, should be placed to the credit of the work in diminution of its cost.

Tools for the ordinary repair of made roads.

345. This should be the course followed in the case of works undertaken on estimate. In such cases the charge for tools and machinery will have to be defrayed out of the estimate, it will therefore properly come under review in conjunction with the other items of the cost; and the articles remaining when the work is done will be valued and transferred elsewhere as required. But the case is different where there is a permanent yearly allowance or estimate, and a current expenditure always going on, as in the case of the maintenance of a made road: and as it is probable that hereafter the expenditure in this method will be large and will be continually increasing, it is necessary to give it consideration.

We considered the question whether it would be expedient to provide tools for such work by an "allotment;" assigning a certain number of tools of the various kinds used, to each division or larger portion of road, as is done in the case of the Military Divisions; the proper number being kept up by returning damaged articles into store, and receiving new ones in lieu. But considering the scattered position of many parts of roads, remote from any Government Arsenal or Stores; the difficulty not to say impossibility of properly fixing the allotment in each case; the complexity of the accounts which would be required, duly to record all the interchanges, receipts, and issues; considering further the great expediency of leaving the Engineers as much as possible unfettered by artificial and formal restraints; on all these considerations we rejected that plan as unsuitable to the circumstances before us, and we deem it far better to leave the Engineers to supply their own wants as they find best; either purchasing from the Government Stores for cash, procuring the articles they require in the general market, or making them up, just as they find most convenient in each individual case. We may add that by judicious arrangements, the Government Stores may be enabled to furnish many of the ordinary English tools required, at a cheap rate; but it is our decided opinion that all such transactions should be for cash, and that the Engineer should be at full liberty to go to the Stores or elsewhere, as he may find best.

As regards the mode of charging such expenditure, it appears to us that it cannot properly be included in the bill for work done in any half year, in any Division of the road; and we think the best plan will be for each officer in charge of a line of road, to send in a separate bill at the end of each half year for all the tools &c. purchased in the course of it; the amount of which will of course be charged to the maintenance allowance of the road. This will give the controlling authorities the means of examining the charges on this account, and comparing their amount on the several roads.

The use of improved Machinery and implements should be encouraged.

346. And here we must declare our decided conviction that the use of improved tools and machinery in the execution of Public Works should be vigorously encouraged; and to that end that great latitude ought to be allowed to Engineer Officers, both those projecting works and those charged with their execution. The constructive arts in this country are at an extremely low point; the tools and implements in common use are very ill devised, and none but the simplest and most elementary means of abridging human labour have been adopted. Even the wheelbarrow is not in use, and in place of it materials required to be conveyed short distances are carried on the head in shallow saucer-shaped baskets. In excavating a canal or forming an embankment the rudest means in use in England are wheelbarrows wheeled up and down inclines formed of plank, and leading to the exact spot where the material is to be deposited; and often even these means are superseded by the use of rails and the application of horse or steam power. In this country no such helps are in use; every shovelful of earth (and the place even of the shovel is supplied by the less convenient momatty) is carried up the steep bank on the heads of labourers, generally women, in the baskets already described; and these being of very open texture, a large part of the load escapes, long before reaching its proper destination. So also in building, in the absence of the wheelbarrows, bricks, mortar, tiles, &c. are brought to the spot where they are wanted, in the same primitive manner.

The value of such help.

347. There are two causes indeed which may be regarded as lessening the value of machinery in India; one is the low price of human labour, and the other the difficulty, delay, and expense, of procuring any but the common tools and implements. The first of these however by no

means operates in reality, to its apparent extent, because the quantity of work performed in a day by a labourer of any class is far below that of a corresponding workman in England; and the second may be regarded as in a great measure only temporary. And in spite of both these neutralizing circumstances there is no doubt that much saving may even now be effected by improved means, in all but the smallest works; while in those of great magnitude the liberal use of such contrivances for economizing human labour is of the very first importance. (Not only is it valuable in cheapening work, and in saving time, and time, as it cannot be too often repeated,) is really money in the case of both works of irrigation and roads; but with regard to some works, it is even essential in order to make their execution possible at all.

348. The Godavery Anicut is a good case in point here. It may confidently be affirmed that without the large use of machinery, that great work could not have been constructed at all; or admitting that its construction might have been within the limits of possibility, it could only have been at a greatly enhanced cost, in the course of many years, and by congregating together vast masses of people with all the concomitant evils of the assemblage of unorganized multitudes in a tropical country, without the means of feeding or sheltering them. The able Engineer who conceived that work and estimated its cost, appears to have been somewhat too sanguine in his computation of the money saving to be gained by the means of construction which he had in view; but though consequently the estimated cost was exceeded by the actual, yet the Committee appointed to investigate the subject recorded their deliberate opinion that the work as executed, and including all the cost of machinery, was exceedingly cheap. Their language is as follows. "The Committee are of opinion that the above mentioned rates (viz. the actual cost of the several sorts of work) are singularly low; and that were each of them increased 50 per cent., the Anicut might even then be pronounced one of the cheapest works ever constructed, if its immense length, and its situation, with the endless difficulties arising therefrom, were duly considered." In reviewing the Report of the Committee, the Government declared their opinion (Ex. Min. of C. February 13, 1849) that the outlay on machinery was out of proportion to the estimate for the entire work. But this opinion is founded simply on a partial view of the large amount of the outlay on the means of saving labour, compared with that on mere labour itself, without any pains to ascertain on sound principles whether that outlay was really less or more than true economy required; and it is directly contradicted by the fact stated by the Committee as to the very small cost of the work done, even including the whole cost of the machinery, though the whole of it ought by no means to be charged on the quantity of work done up to that time. It may be observed too that the same Committee, with the addition of one more officer, recommended for the Kistnah Anicut a much larger proportionate expenditure on machinery than had been incurred on the Godavery Anicut; and the Government adopted and sanctioned that estimate. We may add that Colonel Cotton, who (after in some degree a party concerned) most certainly be regarded as by far the best judge of the question, arrived at a deliberate and decided conviction, after seeing the whole progress of the Anicut and other works on the Godavery, that the real error committed on those works was not a too lavish but a too limited expenditure on Plant and Machinery.

Instance of the Godavery anicut

349. We have remarked at some length on this case, because it is the only one on which as yet the resources of European science have been applied in any considerable degree to the execution of works in this country, and because it affords such strong encouragement to further progress in the same direction. In order to the promotion of this object it seems essential that much latitude should be given to Engineers in the selection of means. In this country as already said, this is still almost an untrodden field, and every thing still remains to be done; and the Engineer Officers in the service of Government are the only class by whom the work can be undertaken. In European countries and especially in England, there are large works always in progress undertaken by private enterprise, and the many able scientific and practical Engineers employed on them make additions from time to time to the stock of constructive skill. In this country on the contrary, the Government Engineers stand alone; all improvement must be introduced by them, and it seems peculiarly unwise to neglect to make use of such a body, to transfer the results of European science and skill to this country.

Latitude in the choice of means should be given to Engineer Officers.

350. It may be said that admitting all this, still the means proper for executing a work can be known and determined at the time of investigating the project and framing the estimate; but though this proposition sounds plausibly, every Engineer would pronounce it a fallacy. It is often

The best means cannot always be determined beforehand.

only when the mind is actually directed to the execution of work that the best means of accomplishing it present themselves; and improved means, and deviations from the original intention, very frequently occur to the Engineer during the very progress of the undertaking; or unexpected circumstances, or contingencies such as no foresight could have anticipated, arise and lead him to alter his plan of proceedings, and the means of working which he requires. Every one acquainted with the history of works in England, knows that this occurs very commonly even in that country, where all the ordinary contingencies are so well ascertained; and how much more likely is it to happen in India, where an officer projecting a work of magnitude is constrained by the absence of subordinate assistance, and the constant pressure of other duties, to leave many details uninvestigated; and where in the execution an Engineer may be said to be working in the dark, still only slowly feeling his way to the best and most economical means of working.

Rigid restrictions would be of very injurious effect.

351. In England an Engineer is able to meet unexpected difficulties, and to take advantage of expedients newly thought of, because he is not hampered by any obligation to adhere rigidly to first plans or first conceptions. Whether working for a canal or railway company, or for one of the great contractors, he is equally at liberty to change and amend his plans of proceeding whenever it may appear expedient; and if the Government in this country would derive the full benefit of the skill of their Engineers they must allow them the same discretion. To debar an Engineer from acting on after-thoughts or new suggestions of ingenuity, or from adapting his measures to newly occurring circumstances, and to compel him to adhere to his own or another's original crude conception of the work, would be most injudicious and unwise: it would be emphatically to sacrifice substantial good for the sake of mere form. And it would be little less injurious, to require that every alteration of the executive measures, should be previously reported to higher authority; that any new idea in the Engineer's brain should be laid before a distant officer and receive his sanction, before being acted on. The practical effect of such a rule would be the same as the prohibition of all deviation whatever. It would often, perhaps generally, be difficult to explain the altered circumstances or the advantages of the change proposed, to the satisfaction of one not on the spot; and the tendency of all controlling authorities being eminently conservative, and in favor of keeping things in statu quo, the change proposed would often fail to find favor. In many cases promptitude of action would be essential, and the mere delay involved in reporting the suggestion to a distant Board, and waiting for a reply, would effectually prevent such a course. And thus it would come to pass that before long the practice of proposing any alteration of proceeding would probably cease.

Reference to the system of rigid restrictions in Ceylon.

352. It may be contended that these remarks are superfluous, inasmuch as the system which we deprecate is not in force here, executive officers being allowed no little latitude in their selection of means; but we have been led into them by the detail which we received from Mr. Norris late Civil Engineer of Ceylon, of the system in use in that island. That system requires that every detail of materials, tools, and labour, down to the minutest particular, necessary in the execution of a given work, shall be specified beforehand when the estimate is submitted, and no unauthorized deviation from the arrangements so detailed is permitted. If it is found expedient to use a little more of one material and a little less of another; if a few more bricks, or a little more lime, or a few more nails should be found necessary, than was at first thought, the purchase cannot be made without previous notification. Unless the extra quantity can come under the amount allowed for Sundries, which however is extremely small, sanction must be obtained, or the charge will be retrenched, even though there may be a saving on the whole estimate. Such a system may be perfect as one of account; but certainly none could be devised which would so effectually stop all improvement: it may possibly afford security against petty peculation, (though we are by no means satisfied that it will do that,) but it will certainly keep every thing in a dreary unvarying routine, without invention or improvement.

The effects of such a system would be very much worse in this country.

353. We cannot but think that this must be the result of such a system any where; but its operation would be comparatively innocuous in Ceylon, where all the work appears to be of a few settled and well known descriptions, and where much of the English mode of working seems to have been already introduced, compared with what would be the case in this country, where as yet every thing is in a great degree new. We have a huge country with vast capabilities of improvement to be developed, and the agents by whose means this is to be done are few and scattered; surely then it is the part of wisdom to give free scope to the display of their energies, and to encourage them to activity, rather than to cramp them by official and technical restrictions.

PART I.] BAD POLICY OF RIGID RESTRICTIONS AS TO MEANS. 117

The amount of discretion now allowed to Engineers under this Presidency in the Revenue Department seems indeed to be more accidental than intentional. That whole section of the Public Works Department has grown up gradually, and has never been systematically organized and regulated; and the degree of liberty now allowed in this particular is probably less the result of deliberate and sound reasoning, than due to the mere fact that the hand of centralization has not yet fully reached this Department. There are symptoms of a disposition to extend it in this direction; and there is much danger, lest when system and order are introduced into the Department (a course which we warmly advocate) they should be extended too far, and applied with too little discrimination. And we are therefore anxious to record our views of what sound policy requires in this particular, and so to do what lies in our power to prevent a consummation which we must so much deprecate.

There are symptoms of a disposition to introduce such a system.

354. Since the foregoing references to the system of accounts in Ceylon were written, we have had an opportunity of seeing a report on the fixed establishments of Ceylon by a Committee of the Executive Council, in which the accounts in the Engineering Department are remarked upon.* In the following paragraph the Committee speak of that particular feature in the system, which we have noticed. "Another crying evil in the constitution of these two departments of Civil Engineer and Commissioner of Roads is the multifarious complication and unreality of their accounts. According to the present system every estimate sent in must specify the exact number of days' work, the exact number of workmen of each kind and denomination, the exact number of inches of any material to be employed. The accounts sent in monthly are compared with these estimates, and checked with the greatest exactness by the Auditor General, and the slightest deviation made the subject of a surcharge. Thus, if the Civil Engineer has estimated for the cost of 1,000 days labour of masons at 1s. 3d. a day, and 1,500 carpenters at the same rate, for any given work, it is necessary for the Auditor to keep open from month to month a book, showing the total amount of days' labour brought to account under the estimate under each of these two heads; and if, at the conclusion of the work it should appear that only 990 days' labour of masons had been charged altogether, and 1,510 days' labour of carpenters, though this deviation from the estimate involves no pecuniary difference, it is nevertheless the Auditor's duty to surcharge the items; but this surcharge again, according to the present system in the Departments of Public Works, is nothing more or less than a ceremony, a fiction of law. When the surcharge goes back to the department, authority is immediately applied for to the Colonial Secretary, and as immediately granted, to substitute an "amended estimate" for the original one, which amendment consists simply in substituting "990 days' work of masons" for the original "1,000" and "1,510 of carpenters" for the original 1,500. We need not expend much reasoning in laying down as a principle that, if this minuteness of check required of the Auditor in examining the accounts of the Departments of Public Works is right, it must certainly be wrong to allow of so easy and habitual a defeat of it as is furnished by this system of "amended estimates."

Testimony of the bad effects of the Ceylon system.

We need not add any thing to this passage, to show the utter inutility of those detailed and minute estimates, and still more, of the exaction of rigid adherence to the estimate in the execution of the work, against which we have raised our voice. We here see that the system has been pursued for many years in Ceylon; and that in order to prevent greater inconvenience it has been found necessary to evade it, by reducing it in practice to a mere "ceremony, a fiction of law." And now after this long trial, the system is emphatically condemned, as hollow and unreal. Thus, with all the advantage of a large skilled and trained establishment, this mechanical minuteness has been found totally to fail of any good effects: and we are confident that the ill effects of such a system in this Presidency, would certainly not be less than is anticipated above, in Para 352.

355. But while we are of opinion that great latitude should be given to officers charged with the execution of work, in the selection of means, we would be far from absolving them from responsibility in this branch of their duties. When the work is completed and the actual result of the means adopted is known, it will be the proper time to examine how far those means were suitable and truly economical. This will of course be done more particularly if there shall have been any thing unusual and out of the common course, in the plan adopted. The duty of con-

Officers should be held responsible for their choice of executive means.

* That report, addressed to the Governor of Ceylon is dated December 13, 1849; it was laid before Parliament and printed by their order in 1852, No. 565.

sidering this question will devolve primarily on the Inspecting Engineer, whose opinion upon it will come under the review of the Board of works.

And for not laying out enough, on machinery as well as for laying out too much.

356. And, we may add, both authorities will do only half their duty if they confine themselves to the question whether too much has been spent on machinery and implements. Hitherto the feeling on the part of the highest authorities has been the same on this subject as on that of superintendence; it has been held that the smaller the expenditure on tools and machinery, the greater the economy. The history of civilization itself may be cited in proof that this opinion is an error, and that on the contrary, the introduction of improved implements and constructive means ought to be diligently encouraged. To this end then the converse question ought also to be debated; it should be considered whether with reference to experience gained on other similar works, the expenditure on means in the case in question was not too small; whether in consideration alike of the cheaper execution of the work, and of the equally important saving of time, true economy did not require that more expense should have been incurred in abridging human labour and urging forward the work.

Excess in this particular should be viewed liberally.

Lastly we would remark that even when it shall appear that some loss has occurred through a too large expenditure on these objects, true policy demands that a liberal view should be taken of such error of judgment. In every country practical improvement is the gradual result of many experiments, of which all cannot be successful; but if failure is regarded as a crime, no one will venture on an experiment, and improvement will be an impossibility. The fault at least was on the right side; it is better to fail in aiming at improvement than never to aim at it at all.

PART II.—THE MODE OF EXAMINING AND AUDITING THE BILLS.

The audit in the Military Department.

357. We will now detail the mode in which the bills in each of the three branches of the Department are dealt with by the controlling authorities; tracing them through every operation they undergo till they are finally disposed of. We will begin with the Military Department. The bills for work done under the orders of the Military Board are sent up by the Superintending Engineers or other executive officers, as the case may be, direct to the Chief Engineer; their despatch being at the same time notified by the transmitting officers to the Military Board. Till recently they were sent to the Board and immediately referred by them to the Chief Engineer for examination; their direct transmission to that officer dispenses with one needless official process.

In the Chief Engineer's office.

The examination of the bills in the Chief Engineer's office consists in testing the multiplications and additions, and comparing the total amount of the bill with that of the estimate; and this having been done the bill is transferred to the Military Board Office, with a report from the Chief Engineer in a few lines, certifying that it has been examined and found correct, or noting any errors that may have been detected. In the Board's Office the bill undergoes a further examination; but this is not a repetition of the examination by the Chief Engineer, but is directed to different points. Those points are to see that the work was performed on due authority, to mark on the bill the department to which the amount is to be debited, and whether it is for a new work or for a repair, to see that all advances of cash on account of the work are duly credited, and that there is a cash receipt for any amount overdrawn, and that the declaration at the foot is in the prescribed form, with some minor particulars. All this having been done, the bill is passed by the Military Board if within the limits of their power to pass, which will be described presently, or if beyond, it is sent up for the sanction of Government. In sanctioning a bill the Board simply notify the fact on the face of the bill under the hand of their Secretary; and when the sanction of Government is necessary, the Board's recommendation is in general simply written across the face of the bill. Where however that document varies materially in amount from the estimate, either on the side of excess or saving, the cause is explained to the Government by letter. When the

By the Military Board.

bills are passed by Government that circumstance is notified direct to the Accountant General and to the Military Board, and the bills are sent to the Military Auditor General. Bills passed by the Board are in like manner sent to the Military Auditor General.

358. The process followed in the last mentioned office is as follows. In the first place the bills are again subjected to a close arithmetical examination, all the calculations appearing in them being tested. This having been done, the amounts are entered in the bill-book of the office, with a short abstract of the nature and object of each work. The bills are then sent over to the Accountant General's office, to the Accountant in the Military Department, (being the Deputy Accountant General,) together with a list; and a copy of this list is at the same time sent to the Military Board with a notice that the bills have been passed and sent to the Accountant. Before signing the list the Military Auditor General compares it with the bill-book, and initials the entries in that book.

In the Military Auditor General's office.

The bills having been received in the Accountant General's office are compared with the list accompanying, and are then entered in a Register styled the "Register of Engineer bills." The bills are then examined, and the advances shown in them are checked by comparisons with the advances as entered in the Register of sanctions. All being found correct, instructions are issued to the executive officers respectively concerned, to take credit in their half yearly accounts for the amount of the bills, and to receive from the Paymaster any balance that may be due to them; and the latter officers are at the same time instructed to pay such balance. At the end of the quarter the bills are brought into the journal of the Transfer Department, where they are classed simply according to the executive officers, all the bills of each officer in each department being entered consecutively. In this journal the proper Head of account is debited with the charge, and the Engineer officer is credited, and thus the debit of advance standing against him is removed. When a balance is due to the officer after the sanction of the bill, it is paid to him by the Paymaster and debited to him like the previous advances, and is included in the credit given in the Transfer Journal for the whole amount of the bill.

In the Accountant General's office.

359. After the termination of the quarter, but before the Transfer journal is prepared, a list of the bills for Military works, made out under the same arrangement, viz: bringing together all the bills of each officer in each department, is prepared by another hand. This is called the "Account of disbursements." After the journal is made out the two documents are verified by a comparison; and being found correct, a copy of the "Account of disbursements" is sent to the Military Auditor General, and the bills enumerated in it are returned to him at the same time. In his office the entries in that account are compared with the amounts entered in his bill-book, to see that they agree, and that the several bills have been debited to the same heads of account to which they were passed in his office. The bills are then deposited among the records of the Military Audit office, being the vouchers for the charges admitted. If at any time any bill is required for reference, the account of disbursements is useful as an index to find it.

In the Transfer Department.

As to the bills for works other than Military, such as the Civil buildings of all the various Departments at the Presidency, these are entered in the Transfer Journal in the Accountant General's office, and are dealt with there in all respects in the same manner as the Military bills, except that no "Account of disbursements" of them is prepared, and no communication with the Military Auditor General takes place respecting them.

360. In the Military Department we thus have a real and effective audit. The processes are needlessly complicated, and there are too many statements and lists prepared; the operations are too much scattered, being divided among no fewer than four different offices; and the repetition of the arithmetical examination by the Military Auditor General is superfluous; but the main objects of an audit are carefully attended to and effectually secured. Upon the Military Auditor General devolves at present the duty of ensuring that no unauthorized charges, that is, no charges of this nature not supported by a proper voucher, shall obtain admission into the accounts. In order to secure this in respect to the charges for public works, he examines the bills themselves as the only proper vouchers for those charges, and after passing them for debit to the Departments to which they belong, he sends them to the Accountant General; and after they have been entered in the accounts, a list of them comes back to him, and he is able to ascertain that they have been debited correctly. Thus the Military Auditor General is able both to verify the charges, and also to secure their being entered in the accounts as passed by him; and none not passed by him can

The audit in the Military Department is effective.

be admitted. Even in the Civil works executed by the Military Board this is true to some extent; the bills for such works also are examined and passed by the Military Auditor General and cannot be admitted into the accounts until that has been done. In the Revenue Department on the contrary we find all these guarantees wanting in a surprising degree. Not only is there nothing of the nature of a regular audit in the Civil Auditor's office, which is not supplied with the necessary information, but even the audit such as it is, is not made to affect the admission of the charges into the public accounts; and charges to the amount of several lacks of Rupees are every year entered by Collectors and admitted by the Accountant General, which have never been sanctioned by Government or passed by any office of audit.

The audit in the Revenue Department.

Examination by the Civil Engineers.

361. The bills for work done in the Revenue Department are prepared in the Collector's office and forwarded thence to the Civil Engineer who transmits them to the Board of Revenue in the Public Works Department. The Civil Engineers are not required to examine the calculations in the bills; indeed several of those officers remark, in their replies to our circular, that the shape in which the bills are prepared precludes every thing like effective examination or check, as we have already remarked. The examination of the bills by the Civil Engineer is chiefly directed to ascertain whether the remarks made by officers of their department when visiting works in progress or after completion, have been duly attended to; and they also notice whether the rates charged for works not visited by them are moderate. In forwarding the bills to the Board the Civil Engineer sends with them a letter of explanation in which he remarks specially on the larger works in the list, and also points the attention of the Board to any particular cases of variation between the prices as allowed in the estimate and as charged in the bill, as well as of excess in the amount of the latter above the former; and explains the cause in both cases. He also states generally what proportion of the work done has been inspected by his Department, and assigns reasons for any deficiency in this respect.

In the office of the Board of Revenue.

362. As soon as a bill is received in the Board's office, the date and the amount are entered in the diary of the estimate maker opposite to its estimate. If the letter received with it from the Civil Engineer contains any thing requiring to be explained, such as remarks that the work was indifferently done, &c. the Collector is at once requested to supply the explanation; but the bills themselves await their turn for examination; and in consequence of the heavy arrears of business in the office, they have usually to wait many months. They are commonly taken up in the order in which they reached the office; and the process of examination is as follows. The estimate maker tests all the arithmetical calculations appearing in the bill; and if any errors are discovered, the bill is returned to the Collector for correction. Having been found arithmetically correct or rendered so, the bill is placed on the Secretary's table, and with it all the correspondence connected with it and the estimate for the work. The Secretary then compares the bill with the estimate, for which purpose as already explained the form of bill shows in parallel columns every item as in the estimate and as in the bill. When any material discrepancy appears in the cost of any item, explanation is called for, even though there may be little or none in the total cost. This having been done, the bill is ready for submission to Government. It is customary to send up a large number of bills at once, but generally bills of each District, and of each class, viz., whether for irrigation works, roads, &c., or buildings, are sent up separately. A letter accompanies the bills, noticing the larger works specially, and the rest in the mass; explanation is also given of any case in which a bill materially exceeds the estimate, which however is rare, except in case of some accident to the work while in course of execution.

The bills are not examined in any way in the Government Office, but are passed on the recommendation of the Board, and generally without any remark except where the amount may exceed the estimate. When a bill is passed by Government, the circumstance is notified at once to the Board of Revenue in the Public-Works Department, to the Accountant General, and to the Civil Auditor; and by the first mentioned Authority the sanction is communicated to the Collectors and to the Civil Engineers. The bills themselves are returned by Government to the Board of Revenue in whose office they remain.

In the Civil Auditor's Office.

363. In this branch of the Department also as in the Military, the charges come in due course under the notice of the Audit Office; but the course of proceeding is much less regular and efficient. It is necessary that we should detail the system at some length, in order to show its practical working.

The audit of all charges in the Civil Audit Office is annual; and it is not on the official year, but on the Fusly or Revenue year, which closes on the 11th July. For the purposes of the audit this office receives both a copy of the Collector's monthly journal, and also after the close of the year, a statement of all the charges incurred in it. The monthly journals as soon as they reach the office are digested into a tabular statement of fourteen columns, viz. one for the 12th to the 31st July, eleven more for the months August to June inclusive, and one for the first eleven days of July which close the Fusly and lastly one for the totals. As each monthly journal comes up, the charges found in it are extracted into this tabular statement, or Memorandum as it is called; and when the last journal has been received the totals are computed and entered in the last column. The annual statement of charges received from the Collectors is compared with this column; and if the two are found to agree, the audit may be commenced. The audit is made upon the annual statement of charges. We will describe the processes of the audit so far as they concern the charges for the Public Works, and as an illustration we will take the charges incurred for works of irrigation.

364. Sums issued from the Collectors' Treasuries for works of irrigation are debited in their journals to one or other of the following two heads, viz. "Advances for the repair of Tanks and watercourses," and "Repairs of Tanks and watercourses." Under the former head are entered all sums advanced for either the construction, the improvement, or the repair, of works of irrigation of all descriptions; and under the latter, viz. "Repairs of Tanks and watercourses" are debited in the first place the monthly salaries of the Maramut Establishments of the Collectors; and secondly, on bills for work performed receiving sanction, the amount is credited to the head of advances, and debited to this of "Repairs of Tanks and watercourses." The same two heads appear in the "Annual statement;" and in that as well as in the office memo. the contents of both are added together and shown as one sum. Almost invariably this whole amount is retrenched or disallowed on audit with the following remark; "will stand retrenched till the Government sanction is obtained;" or "till accounted for." This retrenchment is communicated to the Collector, who thereupon sends to the Audit office a copy attested by himself, of any sanction of Government that he may have received for any part of the amount so retrenched. On receipt of this, the Civil Auditor admits so much of the charge, and the remainder continues under retrenchment. In other words the amount continues an outstanding balance; and being increased by the addition of the disbursements of the current year, the aggregate amount comes up again in the same manner in the annual statement for that year, and is dealt with as before.

Course of audit there.

365. And here it may be observed that the Government always communicate to the Civil Auditor immediately, all sanctions granted for expenditures; and those sanctions are recorded in the office; and the Collector in adjusting an advance by an actual charge almost invariably quotes the sanction for the charge, except in those cases where the adjustment is irregularly made prior to sanction. Yet the Civil Auditor's office makes no use of the sanction received from Government or of the Collector's citation of it; but though he has that order as received direct from Government, and under the original signature of the Secretary to Government, he obliges the Collector to send up a copy of it with the decidedly inferior guarantee of his own attestation, and passes the charge upon that. The cause of this mode of proceeding appears to be that the Collector's journal is never looked at in the Civil Audit office after having been abstracted into the "office memo," above described; and as the reference to the sanction given in the journal is not transferred to that memo, it is forgotten and overlooked. When the Collector's "annual statement" gives a reference to the sanction, then, in some cases, we were told, the office copy of the sanction is made use of, and the Collector is not called on for another. The practice of requiring the Collectors to send up copies of the Government sanction is certainly wrong. In the first place it gives useless labour, because the sanction is actually in the Audit office already; and further, even if it were not, it is the duty of that office to procure the order or a copy of it from the Government office. Presidency officers should be prohibited from requiring local officers to send up to them copies of orders which if not already in their office, can be obtained on application.

Government sanctions are communicated to the Civil Audit office, but not made use of.

366. We have stated that the charges of the Collectors' fixed Maramut establishments are among those thus annually retrenched pending the special sanction of Government, and we must explain how that happens. In all other departments, the fixed establishment is sanctioned by Go-

The fixed Maramut establishments.

vernment once for all; the sanction stands good till further orders, and is authority to the audit department to pass charges incurred in conformity with it, without the necessity for a fresh sanction from Government every year. In the Revenue branch of the Public Works Department on the other hand, the Collectors' establishments, though not less fixed than in other departments, have never been exempted from the necessity of an annual sanction; and the whole of them are consequently retrenched every year in the manner above described. When a Collector sends up to the Board of Revenue his bill for the ordinary repairs of the previous year, he sends up also a statement of his fixed Maramut Establishment for that year, and the sums are sanctioned by Government at one and the same time. No reason appears why these Establishments should not be dealt with like other establishments; they are not even paid out of the estimates of particular works as in the case of temporary servants in this Department, and certain officers in the Road Department, but are paid from the Collector's Treasury like other fixed establishments, and it is hard to say why a permanent sanction, once for all, was not given to them long ago. We are of opinion that this anomaly should at once be remedied.

The refunds.

Another source of confusion is the refunds or recoveries made out of sums advanced for these works. Under the present system a certain sum is first debited for Public works; and where, after the work is completed, a surplus remains unexpended out of the advance made, this surplus is refunded and recredited in the accounts. These refunds are entered in the journal whenever they occur, and the Collector in his explanatory memo. sent up not with his accounts but in reply to objections to them, directs the attention of the Civil Auditor to such entries; and the Civil Auditor having satisfied himself by a reference to that entry admits the recovery in his audit.

The audit of a year's accounts of Rajahmundry Collectorate.

367. As an example of the operation of the system we will give the Audit of the accounts of the Rajahmundry Collectorate for Fusly 1258, so far as this head of charge is concerned.

The total outstanding balance under the two heads "Advances for the repair of Tanks and watercourses," and "Repair of Tanks and watercourses," in the reaudit retrenchment paper for Fusly 1257 (A. D. 1847-48) amounted to Rs. 80,719-15-1, and this amount was carried forward into the accounts of Fusly 1258. In the last mentioned Fusly the sums "advanced for the Repair of Tanks and watercourses" amounted to Rs. 41,109-13-5, and the disbursements on account of "Repair of Tanks and Watercourses" was Rs. 3,950-14-7, making a total of Rs. 45,060-12-0; and this sum added to the outstanding balance at the close of the preceding year make a total of Rs. 125,780-11-1. These amounts were obtained in the mode above described, from the Collector's journal for the year ending July 11, 1849. The first audit on that year's accounts was sent out on the 3d May 1851, and the whole of the above stated amount was then retrenched. In reply the Collector sent in a statement on the 9th July 1851, showing that out of the amount retrenched, Rs. 38,215-9-7 had been sanctioned by Government; and that a sum of Rs. 1,567-8-0 had been refunded to his Treasury within the Fusly making a total of Rs. 39,783-1-7 and leaving a balance unaccounted for to the amount of Rs. 85,997-9-6. The sanction of Government just referred to was sent by Government to the Audit office in October 1850; but was not used till quoted in the Collector's explanation. In this case however it will be seen that the sanction was not granted by Government till long after the close of the year to which the accounts under Audit referred. Again as to the amount refunded, Rs. 1,567-8-0, this was duly entered in the journal which was in the audit office; but it was in a variety of small sums scattered over the whole twelve months journals, without any explanation; and therefore was not taken notice of in the audit. On receiving this explanation accompanied by a copy of the sanction of Government, and finding the refund alleged borne out by the journal, the audit office immediately admitted the charges covered by the sanction and the refund, and the remainder, Rupees 85,997-9-6 stood over to be accounted for in the following year's audit. This final order, or reaudit as it is called, was passed on the 18th July 1851; being above two years after the close of the year to which the accounts referred.

This mode of audit is irregular and unbusinesslike.

368. Nothing can well be imagined more irregular or unbusinesslike than such a mode of audit, if audit it can be styled at all. The Audit office has no information as to the object of the advances submitted to it; and when it receives the Government sanction and admits a charge, it has no knowledge what works compose the sum sanctioned, and still less what compose the remaining balance. The Civil Auditor receives notice of the Government sanctions, but neither in the sanction nor any document accompanying it, nor in the Collector's accounts, has he any means

of knowing to what expenditures they refer. He might indeed procure the bills from the Board of Revenue, but this is not done as a general practice, but only when the Civil Auditor's office has difficulty in determining the exact amount sanctioned, and then the only thing done is to compare the totals. Indeed the principle of audit is wholly wrong: the proper mode of auditing accounts is to compare them with the vouchers by which they are supported; but in this case the Audit office has no vouchers. It does not as a rule take notice of the bills, nor has it the means of using them as vouchers to support charges, because it is not made acquainted with the particulars.

369. And as the audit is no real audit, so the retrenchment made is no real retrenchment. In other departments, when a charge is disallowed the amount is ordered to be recovered either from the officer who made the unauthorized disbursement or from those who received it; but here the retrenchments as they are called are not levied or ordered to be levied. The retrenchments thus made for tanks and watercourses only, amount to about sixteen lacs a year. But in fact this large amount merely stands over from year to year; the Civil Auditor has no information to show him of what the balance consists, whether the charges are really for tanks and watercourses, or whether they have been incurred on proper sanction; but the amount stands over. Under such a system a Collector may have advanced half a lac of Rupees without any proper authority, and yet under this system of carrying forward the balance from year to year, without giving detail of its constituent parts, neither the audit office, nor as we shall have to point out in our next Section the Accountant General's office either, would have any knowledge of the transaction.

The retrenchment made is not a real retrenchment.

370. In point of fact the audit of the charges in this Department is really made by the Board of Revenue. That Board examine the bills; and it is only after they are satisfied that the charges were incurred on proper authority, that they are at fair rates, and that they are arithmetically correct, that they submit them for the sanction of Government.

The audit is really made by the Board of Revenue.

The Board test all the calculations in the bills, and the Audit office does not meddle with the bills at all; it is the Board also who examine the correctness of charges, and with the sanction of Government order the retrenchment of such as are not considered admissible; and in the case of balances struck off as irrecoverable or for any other cause, it is the Board only who investigate them and obtain the sanction of Government. The operation of the Audit office in fact is confined to simply ascertaining that the total amount taken credit for by a Collector agrees with the total sum sanctioned by the Government; as for the particulars in either case, it enquires nothing about them. On all such points the Civil Auditor's office trusts entirely to the Board of Revenue; it has not even the means of knowing that the charges are debited to the proper department. The after proceedings of the Civil Auditor's office add nothing whatever to the security thus obtained by the examination of the Board; and all that seems to be wanting to make that audit real and effectual is some mode of bringing it to bear on the Public accounts. And this would be effected by requiring them to keep a set of books embodying all the transactions of the Public Works Department, which should be subordinate to the General Books, and the results of which should be incorporated in them: we shall recur to this subject.

371. We must observe that even in this matter of bringing the results of this audit by the Board of Revenue to bear on the Public accounts, the Civil Audit Office is wanting. Although the rule is that the charges in this Department shall not be brought into the accounts till finally passed and sanctioned, and though the very object of the Audit would seem to be to ensure the observance of that rule, yet there is no communication between the Audit office and the Accountant General's office as to the charges retrenched. We found instances of large amounts systematically introduced into the accounts of some Collectors as expended on Public works, and admitted by the Accountant General into the General Books, which yet had neither been sanctioned by Government, nor passed by the Civil Auditor or by any other competent authority. We shall have to advert to this subject in the following Section, in speaking of the adjustment of advances. We will here merely notice that in several Collectorates it is the practice to debit the advances for buildings and roads as actual charges, without any sanction from Government for doing so. In some few Districts the expenditure on Irrigation works also is thus charged. In Tanjore in particular above a lakh and a half of Rupees is thus every year charged in the accounts, and is admitted by the Accountant General's office, although unsupported by any valid authority, and although that office has no knowledge whether or not such charges are afterwards subjected to audit. It may be true that when any part of the sums thus charged are afterwards disallowed by the Board or by the Government,

The audit does not influence the admission of charges into the Public accounts.

the amount will be duly recovered and credited. But the office of account has no knowledge of such retrenchments.

The Civil Auditor ought not to take cognizance of advances.

372. It seems to us to be an error, and one productive of much confusion, that the Civil Auditor should take any cognizance at all of advances. It appears to us that the Province of audit is to take care that charges are not admitted into the Public accounts without due warrant; but advances are not charges at all. It is true that neither ought advances to be made without due authority; but it appears to us that the regulation of them falls rather to the office of account than that of audit. At present in the Public Works Department advances and charges are mixed up together in the most irregular manner, and confusion is the inevitable result. It is as a consequence of his taking cognizance of the advances, that the Civil Auditor is obliged also to look to the refunds; although properly his duties do not concern them either. If however our opinion is considered to be wrong in this particular, and it is ruled that the Civil Audit office shall still deal with the advances, it is absolutely necessary that he should receive some information about them; at present he is without any. He must be informed of the authority under which each advance is made; and must be furnished with the means of tracing the advance to its settlement by sanctioned bill for work or otherwise. It will also be necessary that the present system of mixing up advances and charges together should be discontinued; the two things are distinct in their nature, and must be kept quite separate, or confusion must ensue. In the following Section we shall treat of the subject of advances and their control and adjustment, at more length.

The course as to charges for Buildings and Roads.

373. The foregoing description and remarks refer primarily to advances and charges on account of works of Irrigation; in the case of outlay on buildings and roads in the Revenue Department the course followed in the Audit office is very similar, and calls for no more than a very brief notice. In that case also the advances and the charges are added together, and the whole sum is retrenched as it is called, till supported by the sanction of Government, and the gross amount not so accounted for is carried forward to the next year as a balance. The advances for works of these descriptions are debited to a general head "Advances on account of the service of Government" which includes advances for various other objects besides Public Works. In the Trichinopoly District the amount of balance outstanding under that head after the re-audit of Fusly 1259 was..... Rupees..1,02,753-11-1
The amount advanced during Fusly 1260..... do .. 11,865-1-10

Total..1,14,618,-12-11

The amount accounted for during the same year by refunds and adjustments was 66,680-13-2, leaving after the re-audit of Fusly 1260, a sum of Rs. 47,937-15-9 to be carried forward to the following year. The advances in Fusly 1260 were under the three heads Revenue, Judicial, and General, and the diminution of the balance was composed of adjustment 65,626-15-2, and refunds 1,653-14-0. The Collector sent up an explanatory memo. in the usual form, showing the heads of adjustment and refund; the Audit office searched out the refunds in the Journal, and finding them agree with the memo. admitted the amount.

The Civil Auditor receives many useless returns and statements from the Collectors.

374. In concluding our notice of the operations of this office, we may observe that not in this Department alone but in all others, it receives numerous and detailed returns and statements, some of which it does not use at all while upon others it bestows much labour, as for example in re-casting the charges found in the Collectors' journals; but while thus exacting these papers, it neglects those which are necessary to enable it to make a real audit of accounts by comparing them with the vouchers. A reform in this particular, while it would make the operation of this office really effective, would also very much diminish the labour now expended in the Collector's office in preparing the statements now sent to it.

The audit of the Road Department bills.

375. The bills in the Road Department are prepared by the executive officers, whether Assistants to the Superintendent, Civil Engineers, or other, and are sent by them to the Deputy Accountant of the Superintendent's office who is permanently stationed at Madras for the purpose of examining the bills. It is the duty of this individual to go in detail through all the calculations of the bills and to correct any errors that he may find; but he has nothing to do with the rates, quantities, or charges, entered in the bill. Having completed this arithmetical examination,

the Deputy Accountant sends the bills to the Superintendent's office; he also sends monthly a diary or journal of his work, and with it a report book containing a list of all the bills remaining with him, with particulars of progress made in their examination. After arrival at the Superintendent's office the bills are next taken in hand by the head accountant, who compares their amounts with the estimates, and notes the differences whether excess or saving; he also tests the calculations in a few places here and there, as a check on the work of the Deputy Accountant. After this the bills are examined by the Superintendent himself. If the rates or prices or other particulars differ from those allowed in the estimate, or appear otherwise questionable, a reference is made to the executive officer; and when all such doubtful points are cleared up, the bills are ready for submission to Government.

376. Formerly there was much delay in sending up the bills from the Superintendent's office, as it was the practice of the late Superintendent to send up bills for works only after the whole had been completed; at present the half yearly bills are sent up as fast as they can be examined and verified in the Superintendent's office. In the construction or repair of a road, there are for each half year several bills for each Overseer's division of Road, for the several descriptions of work, and they are prepared with much minute detail. And besides these there are also the Establishment rolls, viz. two for each division of Road, all which are prepared monthly, and all of which under the precept plan go up to Government with the bills for work. It may be conceived therefore that the number of bills sent up at one time to Government in the case of an extensive work whether of construction or repair, must be very great; we find that the number of bills sent up at once was formerly often as many as a hundred and sometimes above two hundred; now probably the number is usually smaller. The bills are accompanied by a list or abstract which gives the amount of each and the total amount. An explanatory letter from the Superintendent also accompanies the bills; it briefly details the nature of the work performed, notices the amount of the actual cost as compared with that of the estimate, and explains the cause of any material difference between them.

Mode of sending them up to Government.

377. In the Government Office the bills undergo no detailed examination. The total amount of the whole batch is simply compared with the total of the estimate; and if the former is below the latter, the bills are passed as a matter of course, and generally without any remark. If the amount of the bills exceeds that of the estimates the explanation given by the Superintendent in his accompanying letter is referred to, and upon that explanation the bill is passed without further question. As soon as the bills are received into the office, all the estimates, letters, and other papers referred to in the headings of the bills or abstract, or in the letter, are collected; and the notices of amounts sanctioned, occurring in the letter are verified. But the details of the bills are not examined in any way, the calculations are not tested, neither are the rates of the charges examined; this could not be done indeed because the Government Office does not contain an establishment of accountants to examine such multitudinous details. Further, no account is kept to see that the expenditure of the Road Department does not exceed the sum allowed, viz. four lacks annually; on this point as well as for the correctness of the details of the charges, reliance is placed on the Head of the Department. As soon as the bills receive sanction that fact is notified to the Superintendent as well as to the Accountant General and Civil Auditor; only the total amount is notified, without any detail. The bills themselves are then transmitted to the office of the Accountant General for deposit, but not for examination.

How they are dealt with in the Government office.

378. For several years after the formation of the Road Department, the foregoing was the whole of the examination or Audit received by the bills; but in 1850 a change was made. On the 22d June in that year, the Civil Auditor brought to the notice of Government that the Superintendent of Roads had notified to him an oversight by which the salaries of certain European Overseers had been paid twice over for some months; viz. once, according to the practice of the department already adverted to, out of the amount of the estimates for the works on which they were respectively employed, and again on abstracts sent in by oversight to the Civil Auditor and passed by him. The Civil Auditor represented that under existing arrangements he was without the power of detecting such erroneous payments, and recommended that the accounts of the Road Department should be sent to him for examination and check,

The order of Government that they should be audited by the Civil Auditor.

Upon this the Government passed an order July 23d, 1850, No. 135, declaring the opinion of the Government that the Civil Auditor ought to "have the same control over the disbursements of the Road Department as over the expenses of all other departments of the state;" and desiring the Civil Auditor to obtain the accounts from the Accountant General's office, and the vouchers from the Superintendent, and to see that the sums charged and paid correspond with the amount sanctioned by Government. The order also refers to the practice with respect to bills for expenditure on roads under the control of the Board of Revenue, as the pattern to be followed in the case of the bills of the Road Department, observing that the Superintendent of Roads occupies in respect of the Trunk Road Department the same position as the Board of Revenue in the Department of Public Works.* But it is to be observed that the bills for work done under the Public Works Department of the Board of Revenue are not and never were examined or audited in the Civil Auditor's office, or any where else, after going through the Board's office and having obtained the sanction of Government; such charges are and always have been passed without question or examination by the Audit office, the sanction of Government being regarded as the voucher or warrant.

The mode in which it was complied with.

379. The meaning of the Government however evidently was that the bills of the Road Department should be audited by the Civil Auditor as those of the Military Department are by the Military Auditor General. This was the sense in which it was understood by the Civil Auditor; and accordingly he obtained from the Accountant General's office all the bills of the department passed by Government up to that time, which were deposited in that office. For some time, however, nothing was done towards auditing them. In his letter of 22d June 1850, the Civil Auditor had asked for an additional establishment for the duty, declaring that without such aid his office was unequal to the task; but this request had been negatived by the Government, and the work remained untouched for two years, viz. till after the middle of 1852. In that year we had begun to make enquiries in the office on this subject; and in August the whole of the bills were put into the hands of one of the Auditors of the office, with directions to examine and audit them. On the 24th March 1853, we interrogated this individual. He informed us that his ordinary duty was to audit all the civil charges at the Presidency which fully occupied his time; that the task of auditing all the long arrears of road bills was laid upon him in addition, and that an assistant was given to aid him in the work. He declared that at the time when we questioned him, he had fully audited, with the aid of his one assistant, the whole of the bills of the road department from its first formation in January 1816 to the 30th April 1851, to the amount of 3,34,767 Rupees. He added however that he had not been able to keep up his ordinary work, which had fallen somewhat in arrears.

The rapid auditing of the arrears shows that an increase of establishment was not wanted.

380. Knowing the minute detail of the Road Department bills, as above described, and the vast numbers of calculations to be gone over, we were inclined to doubt the man's assertion that he had really got so rapidly through this enormous quantity of work, and his explanation did not altogether remove our suspicions. When asked as to the number of errors he had detected he said he had found a small number to the aggregate amount of only a few pice; but he had prepared no statement of the amounts admitted and retrenched, and he had no memorandum of errors discovered, and during the whole seven and a half months that he had been engaged on the work no audit or retrenchments had been sent out. Supposing his assertion to be true wholly, or even of any considerable part of these bills, the fact that out of so large an establishment, two men only, and they neither of them remarkably intelligent or skilful at accounts, could in so short a

*We cannot but observe that this description of the position of the Superintendent of Roads appears to us to be erroneous. The Public Works Department of the Board of Revenue is strictly a Department of control; it has nothing to do with the preparation of estimates, the issue of money, the execution of work, or the preparation of bills. The Superintendent of Roads on the other hand prepares, himself, a large proportion of the estimates of his Department; the funds required for the execution of work are drawn by him, and on his responsibility, and are by him distributed to his assistants from time to time as wanted; he is required immediately to superintend and direct the execution of work, and under the order of January 31st 1851 in particular he is strictly an executive officer; lastly, though the bills of work done are not made up in his office they are made up and signed by the subordinates of his own Department, and are examined and countersigned by him. Of all these four functions none at all resemble any duty performed by the Board. And if it is desired to find in the Maramat Department a parallel to the position of the Superintendent of Roads, it must be sought not in the Board of Revenue, but in a union of the two offices of Collector and Civil Engineer.

time, without being relieved from their usual duty, though not entirely without delay of it, audit such a large mass of arrears, shows conclusively that the Government were perfectly justified in refusing Mr. Bruce's application for an increase of establishment, stated to be necessary even for the duty of auditing the current bills.

381. Thus much of the detailed examination of the Road Department bills in the Civil Auditor's office, as ordered by Government in 1850 and commenced in 1852; as regards the general audit of the charges in that department the same system is followed as in the case of the Public Works in the Revenue Department. The total advances, so far as not previously accounted for are brought forward from year to year, and from the sum is deducted the amount sanctioned by Government or refunded during the year; this latter sum is admitted or passed, while the remainder is carried forward as a balance to the following year, or as it is termed, it is "retrenched." In this department as in the other, no means are used to connect this audit with the admission of charges into the public accounts; to prevent the admission of charges not yet subjected to audit or disallowed at it; though we must add that we believe no instances of such irregular adjustment have occurred in the Road Department. What is more remarkable still is that although the detailed examination of the bills has been ordered by Government as a part of the audit, and though it has been actually carried into effect to some extent, yet no attempt has been made to connect the two operations together; the detailed examination of the bills, with the admission of their amounts sanctioned by Government. The two operations are carried on as if they were wholly unconnected with each other.

The general audit of the Road Department charges by the Civil Auditor.

382. We have already adverted to the fact that the salaries of a part of the permanent establishment of the Road Department are paid out of the amount of the sanctioned estimates, and charged in the bills for the work done. Monthly bills for these salaries are sent up to government with the bills for work, and are passed in the same way without any examination. The whole reliance is on the good faith and the carefulness of the Superintendent of Roads; no check over him has ever been exercised in the Government Office, and all that has hitherto been done in the Civil Auditor's Office would probably fail to detect a double charge for an officer on two works at the same time. We see no reason for this departure from the rule followed in other departments, and we must repeat our recommendation that all the fixed establishment of the Road Department should be sanctioned once for all office, and the monthly charge be audited by the proper Audit Office, as in the case of other establishments.

The salaries of the establishment.

383. It will be seen from the foregoing detail, that in all three branches of the Department the mode of examining the bills is the same, viz. in each of them it comprises two operations, the testing of the arithmetical processes exhibited on the face of the bill, and comparing the amount of the bill with that of the estimate. In the Military Department the former of these is performed twice over; and in the Road Department also, if we include the examination by the head of the department.

General remarks on the processes of the audit.

We are of opinion that neither of these operations is of much value as a real test of the justice of the charges. The former, the arithmetical examination, seems to us to be of little value or importance, and if relied upon, as at present, as a chief guarantee against fraud, we think it likely to mislead. It must be remembered that the cost of the work, the amount actually disbursed on it, is a fact which stands by itself, and which is known to the officer preparing the bill, by means quite unconnected with facts or calculations exhibited in it, viz. by his Cash Book. Those other facts exhibited in the bill are certain quantities of labour and materials, at given rates. Here are three sets of facts; and the calculation is only a means by which they are brought into comparison. The amount expended then being known as a fact, if the multiplication of the quantity and rate does not give a result agreeing with that, the officer will know there is some error, either in the calculation or in the items, and he will set to work to discover it. Supposing the whole to be in good faith and honesty this will not be difficult; and if there is intentional fraud and overcharge, there will be still greater care to make the items of the calculations agree with the totals; and provided there is this agreement, which is so easily made fraudulently, the requirements of the arithmetical test are satisfied; it is incapable of going further back to the execution of the work where the real fraud or negligence of any, exists. It can only ascertain in short whether the alleged facts set forth in the bill agree with each other, but not at all whether any or all of them agree with the actual facts.

The arithmetical examination is of little use.

The errors it discovers are utterly insignificant.

384. And the actual discoveries effected by this arithmetical examination accord with this view of its inutility. We learn from Mr. Wylie the intelligent Manager of the Board of Revenue in the Department of Public Works, that errors are occasionally discovered in the calculations of the bills of that department; that it was formerly the practice to alter the totals accordingly; but that it was usually found afterwards that the error was not in the totals but in the elements set down as composing it; and that it is now, therefore, the practice of the office, to return the bill found to contain error, to the Collector's office for correction, whence it generally comes up again with the total the same, and the items amended to agree with it. So also we learn from Lieutenant Foord the late Adjutant of Engineers, that the corrections made in the Chief Engineer's office in the examination of bills sometimes substitute a large error for a very trifling one. He gives the following examples which however is only supposititious. "An item may be, 28,000 bricks at 1 Rupee a thousand 38 Rupees. The 38 would of course be altered to 28, but it may nevertheless be correct; the error being in the 28,000 which ought to have been 38,000."

The comparison of the bill with the estimate is pernicious if too much relied on.

385. The second operation in examining bills, viz. their comparison with the estimates, is not only useless as a check, but we have no hesitation in declaring that as practised at present it is positively pernicious.

An estimate is very useful for its proper object; and that is to specify the work to be done, and to furnish a probable and approximate idea of the cost. The amount shown in an estimate cannot be any thing better than an average, being based on averages; and it deals with matters which vary greatly according to contingencies of weather and other circumstances which cannot be known beforehand. It seems obvious then that the estimate being thus an average, cannot properly be made the standard for strict comparison in an individual case. If it was fairly made the actual charge will exceed it in some cases and fall below it in others; it will exactly agree with it in but a small number. We are decidedly of opinion therefore that the charges in the bill should be judged of on independent grounds, and with very little reference to the estimate. The work should of course be done according to the design and the specification therein expressed; and unauthorized deviation from them should not be permitted, except in such cases as those referred to above in Paras 349 &c. where the interest of the Government requires that latitude should be given to an Engineer. But the charges in the bill should be dealt with by themselves, and should be tested by those means which exist for trying them, and which are much more exact than those for trying the estimates; viz. an examination of the detailed charges, in comparison with the actual circumstances, and with the usual cost of similar labour and materials in the vicinity. Instead of making the estimate the test of bill, the latter should be made the test of the former; to this extent at least, that in case the actual charge materially exceeds the estimated amount without any special circumstance to account for it, the officer who made the estimate shall be required to explain his miscalculation.

It encourages false accounts and leads to high charges.

386. But we have said that the present system of making the estimate the standard with which to compare the bill, and of requiring that the bill shall always be within the estimate, is productive of positive evils; and the evils we refer to are that it encourages the garbling of accounts, and that it tends to increase the cost of work. A fair estimate as already said must be an average; but if an officer knows that he will be worried for explanation, and probably censured; if his estimate is at all exceeded, he will raise it in self-defence, and instead of an average will make it a maximum. And all the Engineer Officers of the greatest experience agree in the opinion that high estimates lead to increased cost of work. Again fair estimates must be too high in some cases and too low in others; and where it is the practice to take no notice of a saving but to require strict explanation of an excess, a powerful temptation is held out to Executive Officers to garble their bills by applying the saving on one work to liquidate an excess on another. We have already stated the reasons which lead us to the conviction that in the Revenue Department the bills are very largely brought into fictitious conformity with the estimates; and such being the case, that must needs be a losing policy which requires that estimates shall be large enough to cover all contingencies. But the anomaly is seen in the strongest light in the Road Department. In that department we have seen that the estimates are not submitted to any scrutiny by any controlling office: and yet the bills for the work, and that executed by the

same department, are tried by no test except their agreement with the estimates. That this system has not produced its natural effect of extravagant cost in that department is owing to the characters of the officers directing it; another proof that the most effectual security against overcharge and fraud in this sort of expenditure, is not to be found in the examination of figured statements by officers at the Presidency, but in an active and trained executive, and efficient local supervision.

387. It thus appears that the scrutiny at present exercised by the controlling Boards at the Presidency into the correctness of the charges in this department is of little or no real value. It may be asked then how may it be made more effectual; for instance would it be practicable or is it expedient to require the controlling Board or other Office at the Presidency, systematically to audit all such bills by comparing them with detailed vouchers. Certainly we are not prepared to to advocate such a plan; the labour would be enormous, it would involve a vast amount of correspondence with all parts of the country, and it would require a large establishment; and after all it would not be effectual to much real good. A very large part of the money spent is paid to persons incapable of giving an intelligent receipt or even of signing their names; and the only voucher for all that large part of the expenditure must be detailed accounts kept by the disbursing officer himself. Thus even in that case, the real reliance must still be on the integrity and the care of the executive officers; for that would be the only guarantee that the original entries in the accounts, the elements of the calculations were true, and unless they were so all after examination would be merely the perpetuation and confirmation of error. It is proper that those accounts should be inspected, but that is a duty which can be only formally and not effectively performed by any Presidency Office. To be really effectual the scrutiny into the accounts must be made on the spot, and with the advantage of local knowledge.

A scrutiny of all the detailed vouchers by the Controlling Authority would be of little real value.

388. It is a general and favourite opinion in Presidency Offices that the security for the efficiency of local administration in the interior is a multiplicity of periodical returns and paper checks; and that this means can effect all that is required. In point of fact such checks are often worse than useless: they take up a great deal of the time and attention of the local officers, which might be much better employed in doing their work than in describing it; and they mislead and blind the controlling Departments themselves, by offering the appearance of a check and a scrutiny which in fact are merely superficial. The history of the Military Board may be appealed to in testimony of the practical inutility of such detailed paper checks. The regulations of 1813 for the conduct of the Engineering Department under that Board prescribed a number of periodical progress reports in great detail, to be sent in for all works in course of execution. It was found in practice, however, that these details were an evil instead of a benefit; and in the revised regulations of 1831, the whole were swept off, and in their place was substituted a simple monthly progress report showing merely the quantity of work performed. It is a certain fact that during the twenty years since elapsed very much improvement has been effected in securing cheap and good work; another proof that detailed paper checks are not the real guarantee of efficiency.

Detailed tables and returns are not the best guarantee for efficiency.

And the Road Department may be again appealed to for strong negative proof to the same effect. No other branch of the Public Work administration has received so little control or audit out of itself; yet in consequence of the efficiency of the Executive Officers, and from the active local check and inspection exercised by the superior of the department, its work where done by its own agents, has been done with a degree of cheapness and efficiency, not attained any where else.

389. In fact the true security for efficiency, in this department in particular, can be found nowhere except in the activity and high character of the local Engineer Officers. Even at present that forms the only real check, without which all others would be useless; and in proportion as the number of such officers approaches the requirements of the service, will its value be increased. We object to imposing the appearance of a check when there is none in reality; the wise course is to put responsibility on those who are in a position to do the duty. Now the local officers do undoubtedly enjoy advantages in this regard in consequence of their position, which can never be possessed by any officer at the Presidency; and it appears to us to be the part of true wisdom to turn those advantages to good account. Taking these principles as our guide, we proceed now to state the course of examination and audit, to which in our opinion the bills for Public Works ought to be subjected.

The real security is the high character of the Engineer officers.

The proper mode of checking and auditing the bills.

Check by the District Engineer.

390. The bills should be made out from the station books and cash book in the mode explained in a preceding Section. They should be made out by the "Executive Agent" or subordinate more immediately charged with the execution of the work, and sent to the District Engineer or other Executive Officer, together with the abstract of the cash book, the station books, and other documents. Those books if prepared as proposed by us will not only be full and complete vouchers for all the charges contained in the bill, but will afford the means of easy and direct comparison with it, without involved and complicated calculations, or intermediate processes. Besides this check, the officer will bring his own local knowledge to bear on the charges; for he will constantly visit every part of his charge, and the works in progress and completed, and will see that the materials and workmanship are good; that the price of the former and the wages of labour are fair; and that both are punctually and fully paid; and he will learn the proper cost of labour and materials in every part of his District, and be acquainted with all the peculiar circumstances which in any particular case may have rendered the work cheaper or dearer than usual, or than was anticipated; may have caused the expenditure of more or less labour, or more or less materials. Thus when the bill comes up for any work, the officer will be able to judge of his own knowledge, of the propriety of the various charges contained in it.

After a scrutiny of this kind, and further after ascertaining the agreement of the bill with the vouchers, the District Engineer will send the bill to the Inspecting Engineer. He will countersign it, and it will in fact be *his* bill, and he will be responsible for its correctness. He will at the same time send an explanation of any material discrepancy between the bill and the estimate, whether on the side of excess or saving or of any other unusual circumstances.

By the Inspecting Engineer.

391. The duty of the Inspecting Engineer will be to examine the rates and quantities charged both for labour and materials, and to satisfy himself that they are fair. He will also assure himself that the work was well done, and that it is in accordance with the estimate, unless where the variation shall be satisfactorily explained. Like the District Engineer this officer also will have other means, besides the mere examination of the documents, of satisfying himself on these and other points; for he, also will make an annual tour of inspection into every part of his Division. And though he will not be able, accurately to inspect and measure work, and that will not be necessary, still these tours and inspections will make him familiar with the general condition of the works of all kinds, and in particular with the quality of workmanship and the execution generally, of those in progress or lately completed. They will also enable him to form a very competent opinion of the diligence and ability of the District Engineer, and to point out to him any part of his arrangements or proceedings which may seem to need amendment. The Inspecting Engineer will not be required systematically to compare the bills with the vouchers; that will be the duty of the District Engineer and on him the responsibility will lie, and no occasion appears for repeating the operation. But as a means of ensuring the performance of that duty, the Inspecting Engineer should occasionally compare a bill minutely with the station books, in order to satisfy himself that the bills are correctly made up from the vouchers. He will also take fit means to see that both the District Engineer and the Overseers or Executive Agents keep their books and accounts in due form and with regularity; this is an important point, and just as an officer inspecting a Regiment is required to ascertain that its books are in proper order, so it should be part of the duty of the Inspecting Engineer to satisfy himself by actual examination from time to time that those of the various officers of the Executive Department are punctually and exactly kept. When the cause assigned by the District Engineer for any variation of amount between the bills and the estimate does not appear satisfactory, the Inspecting Engineer will make further inquiry, bringing his own local knowledge to bear on the subject. Having satisfied himself by these means, general and special, of the propriety of the charges in the bill, he will send it up to the Board of Public Works.

By the Board of Public Works.

392. The bills will thus come before that Board with full guarantee that the elements of which they are composed are true, and that the charges are fair and right, and not much will remain for the Board to do. Although the arithmetical examination of a bill is not of any great value as a test of its justness, and certainly ought not to be relied on to the extent it is at present; yet we think that examination ought certainly to be made once, to detect oversights. That examination will properly be made by the central controlling office; and will be one part of the duty of the Board. It will also be proper that the Board should compare the charges in the

bill with the current rates, prices, and quantities, recorded in their office; this comparison is not made now even in the Chief Engineer's Office, because the only rates there recorded are too little trustworthy, but with better information it would be a useful test. It should not indeed be made the unvarying standard; that would only lead to error. But if made with due allowance for differing circumstances, it may be useful. The amount of the bill should also be compared with the estimate; though not in such a sense as to make that the standard by which to judge of the bill. Besides the foregoing, the Board will likewise look to the correctness of the bill in point of form; and they will mark on it the Department to which the amount is to be debited.

393. And here we think the detailed examination of the bills should stop. It appears to us that nothing is gained by repeating the arithmetical scrutiny in the Audit Department, and that the time and labour devoted to that operation are simply wasted. The number and amount of errors detected in the examination by the controlling Boards and officers are extremely small and trifling, but those in the after examination by the Audit Department are still fewer and more insignificant. We requested the Military Auditor General to inform us of the number and amount of corrections made in his office in the bills of the Military Department; but he replied that he was unable to do so. Lieutenant Foord, however, informed us that the corrections so made by the Military Auditor General amount on an average to one pie, or the 192nd. part of a Rupee, a year; and this out of a total of nearly three lacks of Rupees yearly. In the Road Department again we have already mentioned that the total amount of errors detected in the Civil Audit Office examination, in bills to the amount of 3,35,000 Rupees was inappreciable. In the Revenue Department one such arithmetical examination is held to be sufficient; and we think the second should be discontinued in the other two branches of the Department.

394. In Bengal there is no such second Audit. The Audit by the Military Board, the controlling head of the Department, is final, the amounts so audited and passed are simply notified by the Board, (or by Government probably in the case of bills needing Government sanction,) to the office of account, for insertion among the charges. In like manner the aggregate charges of the Ordnance Department of the Military Board at Madras are notified after the close of the year to the Military Auditor General, and he admits them into his accounts without subjecting them to any audit whatever. The Ordnance charges amount to about twenty three lacks annually; and they are audited solely by the controlling authorities of the Department, viz. by the Military Board. The charges for Public Works in the Military Department are in like manner audited by the Military Board; and no more reason appears for subjecting them to a second audit, than the very much larger Ordnance charges.

395. We must again repeat that the arithmetical examination of the bills is by far the least important part of the audit, in the Public Works Department especially. The professional part, which examines the rates of charge and the more general features of the work, is very much more valuable. Yet because the former is most easily made, requiring a lower species of skill, and because it affords the appearance of exactness, a great deal is made of it. The system of audit in the Revenue Department requires reform because at present it sees no bills of actual charges, but only abstracts, and those in a wrong form; but the system is right so far as this, viz. that the audit by the Professional Department is made the real and sole audit; what is wanting here is a connection between this audit and the admission of charges into the public accounts. In the Road Department the only audit except that by the same officer who incurred the charges, is a mere arithmetical one by the Civil Auditor; and in that department also neither audit nor sanction is made to affect the admission of the charges into the public accounts. In the Military Department in which the audit is in other respects the best of the three, this second arithmetical audit is added. It is superfluous and useless and ought to be abolished.

396. Thus much of the auditing of bills for work done. As to the charges of establishments we have already declared our opinion that the whole of the fixed establishments in the Public Works Department should receive permanent sanction, and be passed monthly by the Civil Auditor. We say the fixed establishment, viz. that fixed from time to time to be permanently entertained. We are well aware that the establishment must be gradually enlarged; that as successive lines of road are constructed, they will require new establishments to maintain them, that as irrigation is extended and inland navigation comes into existence, the canals by which these great objects are effected will need to be managed and controlled by persons entertained for that special duty; and

A repetition of the arithmetical examination is quite unnecessary.

It is not practised in Bengal.

Or in the Ordnance Department of the Madras Military Board.

The arithmetical audit is the least important of all.

The audit of the fixed establishment charges.

that as the operations of Government in the promotion of these improvements become extended, the projecting and executive establishments too must be enlarged, till it reaches some such scale as we drew out in our First Report. But though the establishment in this department must thus be enlarged, that is no reason why the existing establishments and the additions from time to time made, should not be regarded as fixed. The idea of a fixed establishment does not exclude change or enlargement; all that it means is that the establishment so far is sanctioned till further orders to the contrary. We are of opinion then that the existing establishment should at once be put on the footing of the fixed establishment in other Departments, to be enlarged or altered as circumstances may require, but till such alterations, to continue in force, and to be passed by the Audit Office without repeated sanction by Government.

PART III.—THE AUTHORITIES COMPETENT TO PASS BILLS.

The practice in the Road Department.

397. We have next to consider what authorities are now empowered to sanction bills and under what rules, and what alterations are expedient in this part of the arrangements. In the Road Department every bill for work done, no matter how trifling its amount, requires the special sanction of Government; and the same is the case in the Revenue Department, with an insignificant exception to be noticed presently. In both Departments this sanction is and of necessity must be the merest form, in the great majority of cases. Large numbers of bills and to large aggregate amounts are laid before the Government at once, and are passed without any attempt at examination. In the Road Department batches of bills, fifty or a hundred or two hundred in number, go up in the mode above described, and are passed by the Government without any examination whatever. The sole thing looked to is whether the total amount of the bills for work under one estimate is within the total amount of the estimate. If it is so, all is held to be perfectly right; if not, then the explanation furnished by the Superintendent of Roads is referred to, and upon that the bills are passed without any enquiry or examination of the details.

In the Revenue Department.

398. In the Revenue Department the bills of a District for a year for ordinary and emergent repairs to irrigation works usually go up to Government at once, to the amount probably of half a lack or a lack of Rupees, and to the number of perhaps 200, 400, or in the case of Tanjore of above a thousand. Bills for new works, for buildings and repair to buildings, and for roads and bridges, are sent up respectively in separate batches; those of each class for a single year from several districts being usually sent up at once. They are accompanied by a few brief remarks by the Board of Revenue, noticing the objects of the largest works, and assigning causes in any case in which the bill much exceeds the estimate. On this meagre information the Government passes the whole mass of bills without further enquiry; certainly without any attempt to examine the bills themselves. The only instance in which this Board passes bills is that of trifling repairs to buildings, under 20 Rupees each. By an order of 1832 Collectors are empowered to incur ordinary Contingent charges to that amount, and in the Public Works Department this is held to include petty repairs. The charges so incurred by the Collectors are sanctioned by the Board of Revenue under an order of 1843, which authorizes them to sanction Contingent charges to the amount of 100 Rupees each. This latter order is only made use of by the Board to this trifling extent, as regards buildings.

In the Military Department.

399. In the Military Department somewhat more latitude is allowed to the controlling authority than in the other two Departments. In 1849 power was given to the Military Board to pass all bills for contract work, provided that the bill in no case exceeds in amount the estimate which shall have been previously sanctioned by the Government. As respects other works, an

order was passed by Government on the 16th October 1840, declaring that "with a view to expedite business, and to obviate the necessity of repeated references to Government on matters of minor importance," the Right Honorable the Governor in Council was pleased to vest in the Military Board authority to pass for payment bills under 100 Rupees for the contingent charges specified in a list appended, including Engineer bills for sanctioned works and emergent repairs. This order remained in force for nearly three years, and was found very beneficial in saving time and labour; but on the 28th July 1843, the limit to the sanctioning power of the Board was lowered to 100 Rupees, though no reason for the change was assigned in the order, or any intimation given that the former degree of power had been found to produce ill effects. From that time the Military Board pass all bills not exceeding 100 Rupees. In an order of the 7th January 1853, No. 65, the Government granted authority to the Military Board in compliance with a recommendation from them, to pass bills up to the amount of 500 Rupees, provided they should be for works done on estimates sanctioned by Government, and should be in amount within their respective estimates. The Military Board understood this order to extend to works in all parts of the country, as their recommendation did; but on the 30th July 1853, a second order was passed by Government, stating that the order was intended to apply only to works inside Fort Saint George, and those outside belonging to the Garrison.

400. The present state of this Board's authority as to passing bills for work done is therefore as follows. Under the orders of 16th Oct. 1840, and 28th July 1843, they pass bills up to 100 Rupees for all works whether on emergency or on estimate. Under the orders of January 7th, and 30th July 1853, they pass bills for works within Fort Saint George, or to buildings outside if belonging to the Garrison of that Fortress, between 100 Rupees and 500 Rupees; provided that in every case the work shall have been done on estimates sanctioned by Government, and that the bills shall be within their estimates in amount. Bills for works not falling within either of these two descriptions are sent up for the sanction of Government. These orders are complicated, and their application to cases coming up causes much trouble in the Board's Office; it is much to be desired that simpler rules should be substituted.

Sanctioning power of the Military Board at present.

Further, we have already noticed that by an order corresponding to that of the 16th October 1840 in this department, the Boards in the Civil Department also were empowered to pass bills for contingencies, to the same amount as the Military Board; but that order has never been construed in the Board of Revenue to extend to the passing of bills for Public Works of any kind, except to the very limited extent above mentioned. It appears to us, that if it is expedient that the Military Board should have power to pass bills to a certain amount, it is equally proper that the same authority should be given to the Board of Revenue in the Public Works Department; and not only that it should be given, but that the Board should be required to use it, so as to diminish delays in passing bills, and in the words of the order in the Civil Department above referred to, "to relieve Government from many of the numerous references now made to it, and which needlessly occupy its time and attention."

The practice ought to be made uniform.

401. But we are of opinion that very much larger powers in the way of finally passing bills for work performed may beneficially be confided to the controlling Boards; or we will say "Board," in anticipation of a single Board of Public Works such as we recommended in our First Report. We are not prepared to advocate the giving of larger powers in this respect to the head of the Road Department as at present constituted, because to do so would increase the existing anomaly of that officer's present position and duties. But supposing that difficulty removed in any way, we are of opinion that the duty of finally passing bills might be very largely laid by Government on the controlling Board or Boards, with the advantage not only of relieving itself from useless labour, but also of laying responsibility on the proper parties.

The powers of the Boards in this regard ought to be much enlarged.

In the case of an estimate, if the Government confine themselves to the proper point for their deliberation, viz. whether the object proposed is worth the anticipated cost, their decision is intelligent and real; but it is different in the case of bills. The question then is whether the work has been efficiently done and at a fair cost, and upon this question the Government are not in a position to exercise any intelligent and independent judgment. To do that, a careful examination of details is essential; and the Government have neither the time, the agency, nor the previous particular knowledge, necessary for making such an examination. But they have officers who do possess that knowledge, who have been constituted for the purpose of performing the duty, and

The Government cannot exercise an intelligent judgment on the question.

who have the command of the necessary agency. It seems then the proper course to lay the responsibility of the duty on those who have the ability to perform it; and on whose information after all the Government must act, if they take the decision into their own hands.

When Government have sanctioned an expenditure, a second sanction for the same is superfluous.

402. Further, it appears to us that when the Government have once after due deliberation given their consent to a certain expenditure for a certain object, it is unnecessary and superfluous after that object has been effected at a cost not exceeding the amount contemplated, to bring the expenditure on that object a second time under the consideration of the Government. This is not done in other branches of the public service. A certain sum is allowed yearly for the pay of the fixed Establishments in the several Departments; and this having been done after due consideration, it is not deemed necessary that the actual disbursements on that account should again be brought before the Government for sanction. Formerly indeed, when our Government was young this was done, and the actual cost of the fixed Establishments was every year laid before the Government and sanctioned; but this was seen to be useless, and the plan of a permanent sanction was adopted so long ago as 1818; the duty of finally passing the actual charge, when within the amount of the sanction, and otherwise in accordance with it, being devolved on the proper office of audit. And it is the same with the pay and allowances of the army, with pensions, and other regular charges.

Analogous cases.

403. Now it appears to us that the case before us does not differ from those just quoted, except that here the payments are variable and occasional while there they are fixed and of regular recurrence; but on the other hand, to balance this difference, the previous deliberation and sanction by Government which is once for all in the case of Establishments, is special for each case of outlay on Public Works. Of all, at least, except those which are regular and ordinary in their nature like the pay of fixed establishment.

The analogy between these two classes appears to be a real one. To act on it would save much detailed work to the Government whose time and attention are believed to be now too much occupied with formal and routine business. It would also abolish a nominal and ostensible check, which in this case as in others, we consider not merely negatively but positively evil, because it leads the Government to believe that they exercise effective control, when in reality they exercise none, and it would lay a real responsibility on the Board in auditing and passing bills.

The practice in Bengal.

404. In support of the opinion that larger powers in the way of finally passing bills for works performed in this department ought to be entrusted to the controlling authorities of the department, we beg to appeal to the practice in Bengal. The following are in brief the rules there as respects both estimates and bills; partly taken from the letter of the Bengal Military Board in Appendix C, and partly ascertained from the Accountant's manual of the North West Provinces and other authentic sources.

First. All ordinary repairs, whether to buildings, roads, canals, bridges, or other works, are undertaken on the authority of the Board, without the special sanction of Government. A sum equal to the average yearly expenditure of the preceding three years is placed at their disposal by Government, at the beginning of each year, to enable them to make the necessary advances of cash for these repairs; and it appears that any amount expended in excess of that is disbursed by the proper officer, on a notification from the Board that they have passed the bill.

Second. All estimates for new works require the special sanction of Government.

Third. All bills whether for new works or for repairs are finally passed by the Board whenever the bill is not more than 5 per Cent above the estimate.

Fourth. Bills exceeding the estimate by more than 5 per Cent are submitted for the orders of Government.

Fifth. A quarterly Report is submitted for the information of the Government, showing the bills passed by the Board in excess of their respective estimates.

Sixth. Bills audited and passed by the Board are sent for adjustment to the office of account with a notification that they have been passed. No further report is made. The audit by the Board is final; no other office makes any further audit, but the amounts of the bills passed by them are at once admitted into the accounts.

Rules proposed to be adopted here.

405. These regulations seem to us to be judicious and based on right principles. They appear to have been long in operation in Bengal. The order empowering the Board to pass bills for work performed was passed so long ago as 1819. For carrying out here the general views

expressed above, we would suggest the following rules; being very similar to those so long prevailing in Bengal.

First. Estimates for all new works and improvements whatever to buildings, and for all to roads and works of irrigation except the minor works proposed in Section I, (Paras 32 and 48) to be left to the discretion of Collectors, will before examination have been fully considered by Government; the bills therefore should be passed without a second reference to Government. In Bengal an excess of 5 per Cent is allowed: it was formerly 10 per Cent and the cause of diminishing it is not known. Adverting to what we have said, of the nature of estimates and of the tendency of strictness in this particular to produce extravagant estimates and high charges, we think it might be expedient to increase the margin allowed to 10 per Cent but this is a matter of minor importance.

Second. The permanent annual allowances for the made roads, which we have recommended as the best means universally of providing for their repair and maintenance, will also be fixed with careful consideration of the requirements of the road, and will partake very much of the character of a sanctioned fixed Establishment. All work done under such permanent allowances should therefore be passed by the Board to the amount of the allowance. If more work in any special case should be considered necessary, application should be made to Government.

Third. All Ordinary repairs to irrigation works will also be limited in amount, under our propositions, by a fixed yearly sum in each District; and the nature of the work to be done under this head will also be determined. Here also, therefore, as in the fixed allowance for roads, though each particular work is not specially sanctioned by Government, yet the total sum is fixed and sanctioned for a particular object, and the expenditure is limited by particular rules. It becomes therefore the function of the departmental Board to control that expenditure, by taking due care, through the means of the Inspecting Engineer their local representative and agent, that the works for repair are properly selected, and the work well done; and finally to audit the bills, in accordance with the rules laid down, precisely as the audit offices audit salaries and allowances and other charges, in subordination to the standing regulations as to the pay of the various appointments, leave of absence, Sick Certificate &c.

Fourth. And the same observation applies to the minor road improvements proposed to be permitted to Collectors as above referred to. They also will be subjected to rules as to total amount and as to nature of work, and the expenditure will be controlled like that on irrigation works, and the bills audited in a similar manner.

Lastly. With regard to all mere repairs of buildings, the expenditure on this account will be ordered by the local officers, and we have given our reasons for recommending that a limit to the total expenditure should not be fixed. But the expenditure will be all of ordinary and usual character, it is certain that such expenditure is necessary though the exact amount and time cannot be determined beforehand. And if it is right, as we firmly believe and have endeavoured to show, that the expenditure should be undertaken without the special sanction of Government, it appears still more useless to lay before Government all the minutiae of these expenditures after they have been incurred; and we think that bills for all these repairs also, should be audited and passed by the Board. This rule we may observe agrees exactly with the practice above referred to as so long existing in Bengal.

406. As to the first of all these classes viz. new works and improvements, when a bill exceeds the estimate by not more than 5 per Cent, it may still be audited and passed by the Board, provided the cause assigned by the local officers be deemed satisfactory: but if the excess is more than 5 per Cent above the estimate, the case should be reported to Government for orders, together with explanation as to the cause of the excess. In all the remaining cases it is not necessary to allow any excess over the permanently sanctioned total amount; but if from peculiar circumstances it should be necessary to augment the sum allowed, either for one year or permanently, the case should be specially reported to Government for orders.

As to Bills in excess of estimates.

With respect to bills exceeding estimates in the case of repairs and other works which local officers shall be authorized to sanction, this is a matter of less importance. Such an estimate is indeed the guide by which the Collector and Inspecting Engineer act in sanctioning, but it is out of a fixed sum granted by Government. There is no question therefore about the consent of Government to the expenditure of the money, but only as to the worthiness of the object to be purchased for so much, and the efficiency and cheapness of the work. If the Board are fully satisfied

on these three points we would recommend that they should be empowered to pass the bill in these cases even though 10 per Cent above the estimate.

Annual reports by the Board to Government.

407. And we are of opinion that the proceedings of the Board under these powers should be made the subject of annual or half yearly reports to Government. The present quarterly report in Bengal, of bills passed in excess of estimates, is only a matter of form; but the reports which we have in view would bring the whole operations of the Public Works Department under the review of Government. Not only the amount of the expenditure in each District and on every species of work, but the general character and direction of the improvements sanctioned by the Government or initiated by the local officers, their effect on the public welfare, the causes for increase or diminution in expenditure, and other particulars, would properly receive detailed notice. We have already in our First Report spoken of these annual reviews, and we must again declare our opinion that such documents would give a real control over the expenditure far more efficient and useful for the objects of Government, than the present plan of going through the form of a Government Sanction to every individual bill. In place of a multitude of unconnected details presented at a variety of times, it would give the Government a general view of the expenditure, which now they never obtain; but which would be indubitably more useful to them than a mere detail of particulars, which if they show any thing distract the attention from the large and general view. And thus it appears to us that the course which we are advocating, would not only throw off from the Government a large mass of detailed work which they perform ostensibly, but are incapable of performing in reality; but would also give them a general view of the operations of this department of the administration, which they cannot obtain under the present system of having before them details only.

Which would give the Government a more effectual control over the expenditure than they have now.

PART IV.—THE DELAYS IN THE PREPARATION, SUBMISSION, AND AUDITING, OF BILLS.

Lists of Bills taken indiscriminately.

408. We have reserved for separate consideration the delays occurring in the preparation, submission, and auditing of bills. And we think the best way of exhibiting them will be to give in a tabular form the actual facts in a number of cases taken indiscriminately in each of the three branches of the Department. The instances thus given were obtained by taking a number of bills at random in the offices of the Board of Revenue and of the Military Board, and in the Road Department, and then procuring from the several offices concerned, the dates of the various events in their course. There was thus no selection or preference whatever; and the instances may be taken as fair specimens of the ordinary course of proceeding. We could have wished to increase their number, so as to strengthen the inferences deducible by enlarging the bases of deduction, but there was much difficulty in getting all the particulars supplied.

Bills of the Revenue Department. For ordinary repairs to irrigation works.

409. We will first take the Revenue Department and will give examples both of the ordinary and the occasional bills. Appendix Q contains the amounts of the ordinary lists of bills of five Districts viz. North Arcot, South Arcot, Salem, Guntoor and Trichinopoly, for a series of five years, and shows the time that elapsed between the several stages of the progress of the bills to audit. The following brief statement gives the same points of information as the larger one; but only the averages of the five years in each district.

PART IV.] THE DELAYS IN THEIR PREPARATION AND AUDIT.

Districts.	AVERAGE NUMBER OF DAYS, FROM				
	The completion of the work to the despatch of the Bill to the Civil Engineer.	Despatch of Bill to the Civil Engineer to its receipt by the Board of Revenue.	Receipt by the Board of Revenue to its submission to Government.	Submission to Government to date of sanction.	Date of the completion, to the Government of the Bill.
North Arcot.....	461	34	197	30	722
South Arcot } 5th Dn..	341	39	295	30	706
} 6th Dn..	344	49	254	18	665
Salem.....	393	69	225	31	722
Guntoor.....	391	35	299	27	661
Trichinopoly....	365	47	258	29	699

410. The ordinary bills as already explained are sent up in one annual list from each district* and each list or abstract contains a very large number of works; in many Districts as many as three or four hundred, and in Tanjore, from the circumstances above noticed in speaking of the ordinary estimates (Para 39) as many as twelve or thirteen hundred. We were unable to get the date of completion of each individual work; nor if we had obtained it, could it have been shown without a very long statement. But the works are all either completed or discontinued as a matter of course under a positive rule, before the end of the Calendar year; and as the monsoon begins about the middle of October, and puts a stop to almost all work, very few of them remain unfinished after that time, while many are completed in July and August. We therefore assume the 30th September as the date of completion of the whole; and we are sure that if the real dates could be ascertained, the mean time would be found to be earlier than that in every district.

Remarks on the Statement.

411. It will be seen in the larger statement in Appendix Q that in all the cases given, a great length of time elapsed between the completion of the work and the final sanction of the bill; the shortest time is 536 days or eighteen months, and the longest is 861 days, or above two years and four months; the average of the whole is one year and eleven months.

Delay in the Collector's Department.

By far the greater part of this very long delay is divided between the Collector's Department and the office of the Board of Revenue. The whole time consumed in the Talook Cutcherry and the Collector's Office, averages 15½ months in North Arcot, 13 months in Salem, 12 months in Trichinopoly, 11½ months in South Arcot, and 10 months in Guntoor. The mean of the whole is 368 days or a trifle more than one year. We have already noticed the causes of this: it is due partly as pointed out in our Third Section (Paras 212 and 213) to the bulk and complexity of the accounts, and to the various tedious processes required to be gone through in making out the bill in the form required by the Board; and partly, as noticed in an earlier part of this present Section, to the practice of sending up the whole of these ordinary bills in a single yearly list from each district, under which practice the bills for all the earlier works are detained till those for the later are completed. It will often happen that all are ready with the exception of a few delayed by peculiar causes, and the whole will be detained several months for those few.

412. The delay in the Board's Office ranges from 72 days the shortest term, to 372 days the longest. But out of the whole thirty cases, there are only two under 100 days, and four under 200; the average of the whole is 255 days, or 8½ months. The chief cause of this delay no doubt is the weakness of the office in the classes required to examine the bills; and as they are taken up generally in the order in which they come in, every one lies a long time before its turn comes. But we must add that much time has hitherto been wasted in the office as noticed in our first Section (Paras 65 and 66) in the laborious but useless arithmetical examination of the estimates. If that is discontinued, the establishment will be more equal to the prompt examination and audit of the bills.

Delay in the Board's Office.

In the Civil Engineer's Office as explained above (Para 361) there is very little to be done to the bills; and the time occupied in that office seems fully as much as there is any occasion for.

By the Civil Engineers.

* South Arcot is an exception to this however, part of that District lies in the 5th Division and part in the 6th; and the bills are in two annual lists accordingly.

But this is no doubt due in great part to the large quantity of work coming in all at once, as other business cannot be altogether put aside; the shortest term is eight days and the longest 105 days; the average is forty five days. It should be added that the period of detention set down as occurring in the Civil Engineers' Offices, includes in fact both the transit of the bills from the Collector to the Civil Engineer, and from the latter Officer to the Board. Both these together probably average not less than five days.

By the Government.

Before Government too the delay is not great; for in that office as already explained scarcely any thing is done; the average time of detention is 27 days. After sanction there is no delay; the sanction is notified to the Board, and is immediately made known by them to the Collector; and the adjustment of the advance in his accounts is made in the journal of the same or the following month.

Occasional bills in the Revenue Department.

413. The foregoing remarks relate to Ordinary bills for repairs to irrigation works; we will next speak of those for Occasional works in the same Department. In Appendix R. will be found a table of the time occupied in the various stages of 105 Occasional bills in the same districts as the preceding. The following is a compendious abstract of that statement.

		NUMBER OF WORKS.																											
Under 25 days.		25 to 50	50 to 100	100 to 150	150 to 200	200 to 250	250 to 300	300 to 350	350 to 400	400 to 450	450 to 500	500 to 550	550 to 600	600 to 650	650 to 700	700 to 750	750 to 800	800 to 850	850 to 900	900 to 950	950 to 1000	1000 to 1050	1050 to 1100	1100 to 1150	1150 to 1200	1200 to 1250	1250 to 1300	1300 to 1350	
From the completion of the work to despatch of the bill to the Civil Engineer.	0	9	6	2	1	4	9	8	18	13	6	15	1	2	9	6	3	1	0	0	0	0	0	0	1	0	0	0	
From the despatch of bill to Civil Engineer to receipt in the Board's office.	42	34	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
From its receipt by Board to submission to Government.....	0	0	0	0	0	25	11	38	26	6	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
From submission to Government to sanction....	47	27	31	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
From completion of work to date on which the bill was sanctioned by Government.....	0	0	0	0	0	0	0	1	3	9	2	0	3	2	7	10	19	14	4	2	2	5	3	3	3	1	1	1	

Delays by the Collector's Department.

414. In a former Section we have already remarked on a part of this abstract viz: on the delay antecedent to the despatch of the bill from the Civil Engineer's Office, but we will briefly notice it again.

It will be seen that of the whole 105 bills, only seventeen were despatched from the Collector's Office to the Civil Engineer, in less than five months after the completion of the works to which they respectively referred; that in the case of twenty-two the time ranged from five months to a year; in fifty-two more, from a year to a year and a half; in thirteen from a year and a half to nearly two and a half years, and that in one case the time exceeded 1150 days or above three years. And yet almost the whole of the works were of small or moderate amount. On reference to the more detailed statement in Appendix R. it will be seen how this delay was divided between the office of the Collector and of the Tahsildar. It is there found that the detention by the Tahsildar after the completion of the work averaged 131 days in the case of irrigation works, and 153 days in other works; while the delay in the Collector's Office averaged 237 days in the former, and 212 in the latter. The cause of this long delay in the Collector's Office is not apparent, but it was probably due in great part to the detention of bills till all of the same sanction or of the same season were ready.

Comparing one district with another much variation is seen. The average delay of the bills for irrigation works in the talook after the completion of the work was only 16 days in Guntoor, while it was 233 in South Arcot; in the Collector's Office it was 46 days in Guntoor and 335 in North Arcot. In the case of works not of irrigation, the average delay in the talook was 59 days in Guntoor and 244 in North Arcot; in the Collector's Office it was 64 days in Guntoor, and 335 in Salem. The whole time, from the completion of the work to the despatch of the bill from the

Collector's Office, averaged 363 days in the case of works of irrigation, and 366 in other works; or just a year in both cases. In both classes of works and in both stages, Guntoor is the district in which there was most expedition; and on the whole North Arcot is that in which the proceedings were the most dilatory.

415. As respects the detention in the Board's Office, it is seen in the abstract that in the case of 36 of the whole number it ranged from seven to ten months, in 68 from 10 months to 15 months while one was detained above a year and a half. Appendix R shows that the shortest time in the Board's Office was 222 days and the longest 570 days; and that the mean period of detention was 307 days or above ten months.

The detention in the Office of the Civil Engineer in no case exceeded 78 days, and averaged forty; but even for this length of time it is difficult to account, considering how little there is to do with the bills there. It sometimes happens however that correspondence takes place between the Civil Engineer and the Collector respecting some particulars in a Bill. The average detention in the Government Office was thirty five days; which also it is difficult to explain. The adjustment occupies but little time, being generally made in the accounts of the same month in which the sanction is given; or if that should be at a late period in the month, then in the following month.

On the whole it is seen that in these works, inconsiderable in amount as they are for the most part, the period occupied from the completion of the work to the sanctioning of the bill ranged from 349 days or 11½ months, to 1473 days, or above four years; the mean period being 749 days or above two years.

By far the greater part of this very long delay as with the ordinary bills, was in the districts and in the Office of the Board of Revenue; and the causes are exactly the same as in the former case, except that the detention of bills in the Collector's Office till the completion of the whole of the works of the year does not operate so largely, because the general rule is not to send in at once the bills for all the works of the year, but only the bills for all the works done under one sanction. That is, where the estimates for certain works are sanctioned by Government in one order, it is usual to send up the bills for all those works at one time.

416. We will next take the bills of the Road Department. It is the practice in that department as already explained to make up the bills half yearly; they are made up by the executive officers in charge of the line of road to which they refer, and are sent to the Superintendent or to the Deputy Accountant of his office; and after examination they are submitted to Government for sanction. We found it impossible to obtain the dates on which the bills were despatched by the executive officer to the Superintendent, and were obliged therefore to throw together the whole term from the completion of the work to the despatch of the bill from the Superintendent's Office to Government. It does not appear however that there is generally any very great delay on the part of the executive officer, not often we believe exceeding a month or six weeks from the completion of the work.

In Appendix S is a table showing the time occupied by the various stages of thirty four bills, or more properly lists of bills, in this department; the following is a compendious abstract of that table.

NUMBER OF WORKS.																											
	Under 50 days.	50 to 100	100 to 150	150 to 200	200 to 250	250 to 300	300 to 350	350 to 400	400 to 450	450 to 500	500 to 550	550 to 600	600 to 650	650 to 700	700 to 750	750 to 800	800 to 850	850 to 900	900 to 950	950 to 1000	1000 to 1050	1050 to 1100	1100 to 1150	1150 to 1200	1200 to 1250		
From date of completion to date on which the bills were sent to Government from Superintendent's office....	61	...	1	1	3	3	1	3	2	1	1	1	2	...	3	3	...	2	1	2	....	1	2	...	1	2	
From the date on which bills were sent to Government from Superintendent's Office to the date of sanction by Government.....	33	1	...	0	...	0	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
From the date of completion to date of sanction by Government.....	.....	1	...	1	4	1	3	3	2	1	...	1	1	2	3	1	2	...	2	1	2	...	1	2	...	1	2

Delay in the Board's Office.

By the Civil Engineers and the Government.

Total delay.

The Bills of the Road Department.

The delay in the Office of the Superintendent.

417. From this it is seen that the bills lie a long time in the Superintendent's office. Of the 34 lists of bills comprised in the statement one only was sent out of the Superintendent's Office within five months from the completion of the work; eight ranged from five months to one year; seven from one year to a year and a half, ten from a year and a half to two years and a half; five from two and a half years to three years; and three from three years and a quarter to nearly three years and a half.

The information supplied by the detailed statement in the Appendix S is more precise. It will there be seen that, with the exception of the single small list of bills above adverted to, which occupied only 38 days, no one took less than 198 days or six and a half months, from the completion of the work to the transmission of the bills to Government for sanction: and that the term ranged as far as 1204 days or three years and four months. The average period was 625 days, or a year and three quarters; almost the whole of it being in the Superintendent's own Office.

The time occupied by the Government in reviewing and passing these bills ranged from fourteen days the least, to 66 days the most; and the average was 27 days. In this department also no delay takes place in adjusting the accounts after the bill is sanctioned. The sanction, being communicated direct from the Government Office to the Superintendent, is generally in time to admit of the adjustment being made in that officer's journal for the same month: in rare instances it is too late for that, and the adjustment is then made in the following month.

Causes of the delay.

418. We fail to find any sufficient reason for the long delays in the Superintendent's Office. The time actually occupied in the examination and verification of the bill is not much, but it seems to have been the practice of the late Superintendent to detain all the bills for work under one estimate till the whole under that estimate were ready, and then to send up the whole to Government at once. The number of bills sent up together under this practice was sometimes very large; thus in the Statement in the Appendix S there are several instances in which they exceeded a hundred, and one in which they were as many as 244. It appears to us that no good object is attained by this practice, and it has the certain effect of greatly retarding the submission of the bill and the final closing of the account. We will add no more here however to what we have already said on this point in discussing the question of the submission of periodical bills.

We understand that the present Superintendent has abandoned the practice, and sends in the half yearly bills as soon as they have been examined in his office, and that as a consequence a large part of the arrear of bills in his office has been cleared off, and that the current bills are now detained a much shorter time than formerly.

The Bills in the Military Department.

419. We come lastly to the delays in the Military Department. With the view of exhibiting the facts we obtained 91 bills for works done in the Military Department, and took means to have the dates of all the events in their progress towards final adjustment, entered in a table. We failed however to obtain the whole of the necessary particulars for more than twenty-nine bills out of the whole number; as to the remaining sixty-two some important dates were not obtainable, and we were obliged to abandon the attempt to get them supplied, and to content ourselves with the small number of instances above mentioned. Even in that small statement there are several blanks in two of the columns, viz. 10 and 11. It will be found in Appendix T, and we will make a few remarks upon it.

Delay in preparing and despatching the bills.

The first column we will notice is the seventh, viz. the period between the date of the survey and that of the bill. The survey does not always take place immediately after the work is completed, but we were unable to obtain the actual date of completion. In the instances in the statement the period between the survey and the preparation of the bill varied surprisingly. In several it was only one day; and again in many others it greatly exceeded a hundred days, and in one was close on a year, being 359 days. And these variations do not seem to depend at all on the amount of the bill: in the case of some of the shortest periods the bills were for considerable sums, while on the other hand the preparation of those for small amounts was sometimes very long delayed. The fact seems to be that the survey does not follow at any certain interval after the completion of the work; and in particular that at remote stations such as Ramnad the transmission of the bill, after it is ready for despatch may often have been delayed a long time till the work could be surveyed. It will be seen that in almost all instances where the bill was despatched very soon after the survey, there was an unusually long interval between the commencement of the work and the survey; in one case at Ramnad, this extended to two years and eight months. On the whole of these twenty-nine works the average time after the survey was made, and before the bill

was prepared was 75 days. But the variations being so great, the number is not large enough to afford a fair average; and further, as the interval between the completion of the work and the survey of it is unknown, and is certainly very considerable in some cases, one material element for judging of the delay of the bill is wanting.

Very considerable delay appears to take place in some instances after the preparation of the bill before it is dispatched, even when the survey has already taken place; in one instance of those in the table this extended to 134 days.

420. The time occupied in the Chief Engineer's Office was not much; in some few instances indeed it was considerable, (in one as much as 76 days,) but probably these were cases in which mistakes had to be corrected by a correspondence; the average term was 26 days. In the Military Board also the time is not long, unless the examination in that Office extends to little more than points of form, and there is little plea for delay. The maximum is 162 days and the average 48 days. The average period before the Government in cases sent up for sanction is 36 days; the maximum is 143 days or nearly five months.

The total period from the survey of the work to the passing of the bill by the Board or the Government averaged 187 days; but we must repeat that long periods appear to have elapsed in some cases between the completion of the work and the survey, of which we have no certain information. By far the greater part of the delay after the survey was between that event and the submission of the bill by the Executive Officer; and if the real date of completion were known the delay in his Office would be found to be much longer than it now appears. The time occupied in examining and passing the bills at the Presidency was not extravagantly large.

421. In the other two branches of the department the delays terminate at this stage; and the adjustment of the advances and the closing of the accounts follow immediately as a matter of course. But in the Military Branch another long delay here intervenes, arising from the detailed auditing of the bills a second time by the Military Auditor General, and the postponement of the adjustment till after that operation is concluded. After the bills are sanctioned, whether by the Government or by the Military Board, they go, as already detailed, to the Military Auditor General for further examination. There they remain as appears from the statement before us an average period of 104 days or three months and a half; the shortest being 17 days, and the longest 210 days or eight months. And even after this process has been gone through there is still a further delay in effecting the adjustment of the advances. Reckoning to the date in which the Accountant General issues instructions to the Engineer Officer to take credit in his accounts for the amount of the bill, the mean time occupied by this last stage is 80 days; the shortest being 14 days and the longest 89. Thus in these twenty-nine instances in the Military Department the delay, after the bill was sanctioned and passed by the Government, before the accounts of the work were finally adjusted, averaged not less than 134 days, or four and a half months. And the whole time occupied between the survey of a work after completion, and the final closing of the accounts of it, averaged 312 days or ten and a half months; the shortest time so occupied was 115 days and the longest 753 days or more than two years.

422. Thus we find on the whole, that the time elapsing between the completion of a work and the final sanctioning of the bill amounts on the average of a considerable number of instances to 696 days, or one year and eleven months, in the case of the ordinary repairs to works of irrigation, and to 749 days or above two years, in the case of other works in the Revenue Department; that the corresponding period in the Road Department has averaged 652 days or nearly twenty-two months; and that in the Military Department the time from the survey of a work (often some time after its completion) averages 187 days or six months, and that in this department, there is a further delay averaging ten and a half months, before the advances are adjusted; making a total period of 164 months in the Military Department from the date of survey to the final adjustment of the accounts. There is no doubt that these delays are an evil; and none also, that they might be very greatly diminished. Their evil effect is two-fold, they produce large outstanding balances in the accounts, and (which is of far more importance,) they remove to so late a period the review of the expenditure, as very greatly to lessen its value. In the case of the Military Department they have a tendency to a further ill effect as regards the Executive officers, viz. that those officers are liable to be detained in the country, till the accounts of the works with which they are connected are closed. We have not indeed heard of any cases in which officers have really been so detained;

In the Chief Engineer's office. By the Military Board and Government.

In the Military Audit office.

Total delays in the Military Department.

General result in all the Departments.

because, much to the credit of the whole body, their accounts having invariably been found correct, the sureties do not fear the responsibility of allowing them to leave the country.

Remedies in the
Revenue De-
partment.

423. Of all the three Departments a remedy is most loudly called for in the Revenue. As respects the delays in the office of the Board itself, they would be lessened either by an addition to the establishment, or by diminishing the other work to be done. We learn that since the work of the office was lightened by discontinuing the submission of the ordinary estimates, the arrear of bills has been diminished; and if it is relieved from the useless labour of arithmetically examining all the other estimates, it will have still more strength to devote to the bills. When the Board is free from arrears itself, it will be in a condition to insist on greater expedition in the offices below, and something may be effected there by this means, especially if the practice of sending up the bills in yearly lists is abolished. But we are not sanguine that even the delays will be very materially lessened so long as the Executive system and establishment continue what they now are. We are convinced that the only effectual remedy for that, and still more for the other evils of the system, will be to make a thorough change such as we have recommended in our Third Section.

In the Road De-
partment.

In the Road Department we have already mentioned that we have reason to believe that much increase of expedition has been attained subsequently to the period to which our Statements refer. And it is certain that with the existing practice of preparing the bills half-yearly, with so good a machinery for their preparation, and with so little loss of time in fact in their preparation and transmission to the Superintendent, no good reason exists for long delay in submitting them for final sanction. The improvements which we have recommended in our Second Section in the books of the Department, and in the mode of preparing the bills, will shorten the time still more.

In the Military
Department;

424. In the Military Department the delays prior to the sanctioning of the bills are chiefly on the part of the Executive Officers; in examining and passing the bills there is very little. A better system as to the daily accounts, and the abolition of the present cumbrous and awkward mode of preparing the bill, as detailed in the Fourth Section of this Report, will go very far to remove all cause for delay, and will make it practicable to have the bill prepared immediately on the completion of the work.

For the delay after
sanction.

With respect to the delay after the bill is sanctioned; this occurs as already said in the Military Department only, and is due to the practice of subjecting the bills in that Department to a second detailed arithmetical examination in the Military Auditor General's Office. Even if this second examination is to be continued, it ought not to be permitted to delay the final closing of the account as it now does for nearly five months on an average. The amount of the bill should be adjusted immediately on its being sanctioned by Government, and the one pice annually of correction in the Military Auditor General's Office might be adjusted afterwards. But we must repeat that in our judgment the process is both utterly useless and wasteful. It costs a very considerable sum annually, and its results are absolutely nothing. And if it be said that it prevents carelessness in the previous audit by the Chief Engineer, it is sufficient to reply that if this argument is worth any thing, there ought to be a double audit in every Department, instead of in this one only.

SECTION VI.

ADVANCES FOR THE EXECUTION OF PUBLIC WORKS, AND THE ADJUSTMENT OF SUCH ADVANCES.

PART I.—THE ADVANCES AND ADJUSTMENTS IN THE MILITARY DEPARTMENT.

425. We come next to the advances for the execution of work, and the adjustment of these advances in the public accounts; which two separate operations though not immediately connected in the order of time, we think it most convenient to consider together, because intimately related in their nature. The practice of the three branches of the Public Works Department varies widely on these points as on others. We must therefore describe the three systems separately: and having done that we shall then state that course of proceeding which appears to us the best for the whole Department. We begin with the Military Branch.

Introductory.

426. With the exceptions to be noticed below, no advance of money can be obtained in the Military Department by an Executive Officer, without special authority both from the Military Board to the Executive Officer to receive each such advance, and from the Accountant General to the Paymaster to issue it to him. And the rule laid down for the guidance of the Military Board in authorizing these advances, is that if the amount of the estimate does not exceed 800 Rupees the whole shall be advanced at once; but that if it is more, it shall be issued in three parts, viz. one-third immediately, a second third when the walls are completed to the height of the rafters, and the remainder when the building is covered in. In the case of works of great magnitude, exceeding 20,000 Rupees, this rule is not adhered to; the advances are then determined according to the circumstances of the case, and the Military Board when recommending the estimate for the sanction of Government, usually state in what sums and at what times the advances will probably be required.

Advances in the
Military De-
partment.

427. When a work is sanctioned by Government, a copy of the order addressed to the Board conveying the sanction, is also sent to the Accountant General's Office, where the purport of it is entered in a book called the General Sanction Book, in which are indiscriminately entered Government Sanctions communicated to the office for expenditures of all kinds and in all departments. It is also entered in a separate Register in the Military Department of the office, which is called the Register of Government Sanctions. The Board having received the order, write to the Commanding Officer of the Division, authorizing him to advance a specified sum to the Executive Engineer, being usually the exact amount proper under the rule above stated, and to commence the work; and the Commanding Officer communicates this order to the Engineer. The Board at the same time notify to the Accountant General, that they have authorized such advance; and the Accountant General then writes to the Paymaster of the Division, instructing him to disburse the amount on application; and specifying the minor head of account to which the advances to be debited. The Paymaster then informs the Engineer Officer that he has received such instructions; for until he has received them he is not authorized to act on the order of the Commanding Officer to make the advance. The Executive Engineer then draws the amount from the Paymaster, on a receipt which specifies the object, the authority, the date of sanction, and other particulars.

Multiplied corres-
pondence.

In the case of those works which the Military Board are empowered to order of their own authority, they in like manner notify to the Accountant General the advances which they authorize, and the same correspondence ensues.

When a building has progressed so far that a second advance is due under the rule, the Engineer reports that circumstance to the Officer Commanding the Division, who then applies to the Military Board; and the Board authorize the second advance, and notify this order to the Accountant General, who, as before, instructs the Paymaster accordingly, and the latter again informs the Engineer. All the same processes are gone through when the third advance is required.

For petty and emergent work.

428. The exception to which we have adverted above is that of work which a Divisional Commanding Officer is empowered to order of his own authority. For such work a Commanding Officer has authority to order the advance of any sum not exceeding 500 Rupees for emergent repairs to any building; and to advance sums not exceeding 500 Rupees at one time, for petty repairs to buildings. All these advances however are to be immediately reported to the Military Board, who notify them to the Accountant General.

For contract work.

In the case of contract work, which however occurs only at the Presidency, the rules for advances are different. Contractors who choose to give security to the full amount of their contract, either by depositing Government Paper or otherwise, receive the whole amount at once. On the other hand those who ask for no previous advances are not required to furnish security for the performance of their engagement; and when security is not given, the contractor after the completion of the work to each of the first two stages above specified, can obtain as "advance" an amount equal to five-sixths of the estimate value of the work so actually done.

Advances to whom debited.

429. In every case the advance is debited by the Paymaster to the personal head of the individual receiving it, whether Executive Officer or Contractor, but with the minor head to which the charge belongs. In the case of Officers, the debit is to him personally and by name, as holding the office in virtue of which he receives it, and not by his official designation only. A separate head of account is opened, both in the Paymaster's Books, and in those of the Accountant General, for every individual so receiving advances. And the advances thus made stand as debits against the parties till adjusted by the passed bill and the refund of the unexpended balance, if any, after the completion of the work. The original receipts given by the parties receiving advances go up to the Accountant General's Office with the Paymaster's Journals, as vouchers for the entry. In the case of advances ordered by the Commanding Officer under the authority above noticed, the advance is debited to the Executive Officer, but the former is held responsible till the advance has been approved by the Military Board.

Control by the Accountant General over these advances.

430. The means adopted in the Accountant General's Office for checking, and finally of adjusting these advances are as follow. As soon as the Government sanction for any work is received, it is entered as above said, in the Department Sanction book, which shows the nature of the work, the date of sanction, the amount of the estimate, with columns wherein to enter the several advances and other particulars. Each individual work is separately entered in this Register. At the same time that the Accountant General instructs a Paymaster to issue an advance notified by the Military Board to be required, the amount is immediately entered in that register as advanced, in the proper column opposite the entry of the sanction. There is also another book called the "Individual book," in which all the advances made, bills passed, and sums refunded, are entered in the Debtor and Creditor form under the heads of the respective Executive Officers. This is the "Account," while the former book is only of the nature of an office Memo; and in this therefore the advance is not debited till after the receipt of the Paymaster's Journal exhibiting it as actually made.

In the case of work sanctioned by the Military Board or by Divisional Commanding Officers, under the power vested in them respectively, the advances are entered in the same register; but those for petty works are not entered separately for every work, but in a single entry for each Division for each half year.

Accounts Current are also sent up by the Executive Engineers.

431. Engineer Officers receiving advances also send up to the Accountant General, half-yearly Accounts Current shewing on one side the advances standing against them at the beginning of the half year and those received in the course of it, and on the other the amounts placed to their credit, either by bills passed for work done, or by Paymaster's receipts for surplus advances refunded; and exhibiting also a list of bills sent up but not yet passed, as well as the particulars of the balance remaining, viz. whether expended on incomplete work, in cash, &c. These Accounts Current are examined in the Accountant General's Office, and compared with the Paymaster's Journals and with the "individual account" above spoken of. In case of any discrepancy appearing, the Accountant in the Military Department writes to the Officer, and the difference is explained or corrected; if on the other hand the Account Current is found to be correct, that circumstance is notified to the Officer. The Accountant General also calls on the Military Board from time to time when occasion requires, to expedite the adjustment of long outstanding advances.

432. After a work is completed, the bill is made out by the Executive Officer and sent to the Military Board through the Chief Engineer, as described in the last Section. If the advances received on account of the work have exceeded its cost, the difference is repaid to the Paymaster who enters the amount in his Journal to the personal credit of the Officer who received the advance, and gives a receipt exactly specifying the work for which this refund is made; which receipt goes up with the bill and attached to it. Thus in every case these two documents, the bill and the cash receipt, agree exactly with the amount of the advances, and at once enable the Accountant General to adjust them in the accounts without any further information, except where the cost of the work has exceeded the estimate. On reaching the office of the Military Board the bill is sent to the Accountant General's Office and is there entered in a Register, after which it is returned to the Board. This Register does not appear to be made any use of, and this process of sending the bills to the Accountant General's Office for registry may be dispensed with.

The adjustment of advances: how the bills come up.

433. After the return of bill to the Military Board the next step is its examination in that office on the points described above; and being found correct, it is either passed at once by the Board if within the limits up to which they are authorized to sanction, or sent up to Government for sanction if it exceed that. If the former, the Board send the bill to the Military Auditor General, with a notification attached, stating that the bill has been passed, and specifying when it was sent to him. The Military Board lay before Government at the end of every quarter, a Statement of the bills passed by them during that quarter in each Department, and the Government record their sanction to these Statements, and communicate it to the Accountant General and Military Auditor General. If the bill is sent up to Government for sanction, the Government when they pass it communicate the fact to the same two offices, and send the bill itself to the Military Auditor General. It would be useful if the Military Board also when they pass bills, send to the Accountant General a copy of their notification above referred to, so as to keep that office acquainted with the progress of bills.

Process of examining and passing them.

In the office of the Military Auditor General the bills are minutely examined, in the mode described in the last Section, and all the calculations contained in them are again tested. This having been done, their titles and amounts are entered in a list, and they are sent over with that list to the Accountant General's Office; a copy of the list is also sent to the Military Board with an intimation that the bills described in it have been sent to the Accountant General's Office.*

434. In this latter office the bills are first compared with the list accompanying, and are then entered in the "Register of Engineer's Bills" (entirely distinct from the register above adverted to) designed to show various particulars respecting them in eighteen columns. This having been done in the Transfer Department of the Office, the bills are sent into the Military Department where the advances entered in them are checked by comparison with those entered in the Register in the office, and being found correct in this particular, they are returned to the Transfer Department, and the debit against the executive Officer is there removed, by crediting him, and debiting the head of account and the Department to which the charge appertains. Orders are then sent to the Executive Officer concerned, to take credit for the amount of the bill; if any sum is due to him, in consequence of the amount of the passed bill exceeding the advances, the Paymaster is also directed to pay that amount to him. After all this has been done, the bills are entered in the Transfer Journal, all those of each Officer in each Department being classed together; those Journals are prepared only quarterly. A list of the bills for Military works, arranged under the same heads, is also prepared by a separate hand. This list is called the "Account of disbursements;" when completed, it and the journal are compared together. All this having been done, those bills which relate to Military works are sent back to the Military Auditor General, together with a copy of the Account of disbursements. The bills are compared in the office of the Military Auditor General with his own list previously made out; and being found correct, the amounts are entered in his account of charges. The bills remain in the office as the vouchers for those charges.

How they are dealt with in the Accountant General's Office.

With respect to work done under the order of the Military Board to buildings in the Civil, Ecclesiastical, or other Departments, the charges for such work do not go into the Military books, and therefore their amounts are not communicated to the Military Auditor General.

* Bills for work done by contract are not examined in detail in the Military Auditor General's Office; indeed they contain no details whatever, being merely drawn for the amount of the contract. In other respects such bills are dealt with by the Military Auditor General in the same mode as Officer's bills.

The control is very complete in the Military Department.

435. We thus find in the Military Branch of the Department very strict means in operation for controlling the advances for Public Works, and for bringing them correctly to adjustment as soon as the works are completed and the bills passed by the proper authorities. This latter is effected by the expedient of the Register of advances kept in the office of the Accountant General, which enables him at once to debit each work (or small batch of petty works) with every separate advance made for it, and at last on receipt of the bill and the cash receipt, to adjust the account exactly and with certainty, without any application to any other Office. But though the system is thus far worthy of commendation to this extent, viz. that it effects its object; yet it does so by much unnecessary expenditure of labour. The practice as to issuing advances is objectionable in respect to the too minute interference exercised by the Presidency Authorities, and the tedious round of correspondence which takes place whenever an advance of cash is to be made. And the system of opening a separate head of accounts for every individual officer receiving such advances, involves a multiplicity of accounts without any commensurate advantage.

So also in the adjustment of the advances; there is much sending of bills backwards and forwards from office to office, which might beneficially be simplified and abridged; and the laborious audit in the Military Auditor General's office, of documents which have already been fully and minutely audited before, with the re-examination there of all the calculations, already carefully examined by the Chief Engineer, appears to us superfluous and unnecessary. On these several points we shall have to offer suggestions presently; and we shall then point out how the same object may be attained by much simpler means, and shall state what part of the duty belongs in our opinion to the Accountant General. We now proceed to detail the system of advances and adjustments in the Maramut Department under the Board of Revenue.

PART II.—THE ADVANCES AND ADJUSTMENTS IN THE REVENUE DEPARTMENT.

There is much want of system.

436. It cannot be said that there is any established system with regard to the advances for Public Works under the Collectors; for though there is in each district a routine practice usually followed, still that does not appear to be in consequence of any general rules at any time promulgated, and the practice varies widely in the several districts. Neither the Board of Revenue nor the Accountant General appears to exercise any control or interference in the issue of these advances; the whole is left to the judgment of the Collectors as to what is proper in each case. We do not object to this freedom of action in making advances; on the contrary we approve of it, as being conducive to the rapid and unimpeded execution of work. But we observe an irregularity and want of system in exhibiting the advances in the Accounts, and a consequent absence of power in the controlling office to check the advances made, and ensure their due adjustment, which we think very objectionable. The general course as explained in a former place is as follows. When a Collector receives the sanction of Government for the execution of a work of any kind, he issues his order to his Treasurer to pay to the Tahsildar of the Talook concerned, on application, a certain sum as an advance; and at the same time he issues an order to the Tahsildar, directing him to send for the money and commence the work. In works of small amount the whole sum is advanced at once; but in general the first advance is from one-third to one-half of the amount of the estimate. The same course is followed in the case of those works the execution of which is ordered by the Collector on his own authority. As soon as the first advance has been all disbursed or nearly disbursed by the Tahsildar, he notifies that circumstance to the Collector and asks for a further sum, and a second advance is then made to him, generally another third, or a fourth, of the estimate; and when that is expended the remainder is usually sent to the Tahsildar. In the case of very large works however the number of advances is larger, as in the Military Department.

437. The advances are debited on the day when they are paid out of the Collector's Treasury, and are inserted in his journal for that month. The amount of detail shown respecting them in the journal is very small indeed; we find more in some districts than in others, but in all it is extremely limited. In the case of irrigation works the advance is debited to the head of "Advances for the repair of tanks and watercourses," and this whether the work in question be a repair or an entirely new work. In general, large sums are entered for a number of works together, without any detail as to the names or nature of the work, or any reference to any sanction for the expenditure. The following are specimens of the entries, taken at random from the journals of several Collectors.

The mode of debiting the advances by Collectors for irrigation works.

	Rs.	A.	P.
(Chingleput).—Advances for the repair of tanks in different villages, as per quarterly account sent to the Civil Auditor.....	9,300	0	0
(Cuddalore).—Amount advanced to several Talooks for repairing tanks.....	3,378	7	0
(Bellary).—Advance made to the Amildars of Kumplee, Koodlighee (and other Talooks named) for repairing 28 tanks, 6 nullahs, and 8 wells, as per Account Particular sent to the Civil Auditor.....	4,462	5	0
(Tanjore).—Advances made for repairing Tanks, &c.....	15,054	5	6
(Salem).—Paid on that account as per Account Particulars sent to the Civil Auditor.....	2,279	2	4
(Ganjam).—Sums advanced on this account to certain Amany Talooks for the year 1851.....	4,050	0	0
(Coimbatore).—Advanced to workmen for ordinary and extraordinary repairs in the different Talooks of the district.....	7,802	0	0

438. Here it will be seen there is no reference to any sanction, no mention whether the works for which the advance is made are Ordinary, Occasional, or Emergent, in other words whether the works are undertaken with the sanction of Government, or on the Collector's own authority; in short there is nothing which could give the Accountant General any assistance in controlling the advances or bringing them to adjustment. The "Account Particular" sent to the Civil Auditor referred to in some of the entries, is a statement sent quarterly by a few of the Collectors, but containing no particulars except the names of the Talooks to which advance was issued during the quarter and the amount to each, with no detail at all as to the nature of the work, or the sanction on which the advances were made. This paper is utterly useless for checking, controlling or accounting for the advances shown in it.

The information given to the office of Account is extremely meagre.

The only district in which somewhat more detail is given of the advances of this nature is Masulipatam. In the journal of that Collectorate it is usual to state whether the work advanced for is ordinary or occasional, a repair, or a new work; the name of the talook also is generally given, and if the advance is for one work only the name of the work also. Even here however neither the date nor the amount of the sanction of Government is stated, and without that information, all the other details are useless to the Accountant General.

439. Advances made by Collectors for the construction or repair of buildings or of roads, in short for all public works other than irrigation works, are required to be debited to the head of "Advances on account of the service of Government." The advances for buildings are arranged under the four minor heads of Revenue, Judicial, General, and Marine, according to the character of the building in question: all advances for roads are debited to the General Department. The entries of these advances in the journals are extremely vague, and often class together things totally dissimilar and unconnected. They rarely specify the name of the work or works concerned, and never quote the sanction of Government. The following are a few examples.

The mode of debiting advances for building and roads.

	Rs.	A.	P.
(Chingleput).—Advanced on account of Saderward charges, and on account of constructing iron rails to the Hoosoor Treasury at Conjeevaram.....	230	1	3
(Canara).—Advanced for the execution of Public Buildings, and purchase of paper. Advanced for the construction of Public Buildings and Roads, for procuring timber required by the Bombay Government, for the payment of Troops, &c.....	1,131	2	6
(Malabar).—Advances made in this month for Buildings General and for the construction and repair of roads &c.....	19,473	13	8
	1,416	2	9

(Ganjam).—For repair of roads and allowances of Captain J. P. Trye as Acting Assistant Agent in the Hill tract of Orissa, &c..... 1,765 0 8
(Tanjore).—Erecting Moonsiff's Court at Manargoody..... 1,000 0 0
(Coimbatore).—Advances for repair of roads and bridges, for conveying Military remittance to the Officer Commanding Neilgherries, and for constructing Barracks at Coimbatore..... 1,680 0 0

GENERAL.

(Cuddapah).—Amount advanced on this account..... 1,354 6 8

It must be added too that it is the general practice in the districts of Coimbatore, Chingleput, Cuddapah, and Salem, not to enter the advances for the construction or repair of buildings, under the head of advance at all; but to debit them at once as actual charges. This highly irregular and objectionable practice appears never to have attracted the notice of the Accountant General's office.

440. An account particular of the "Advances on account of the service of Government" is sent monthly to the Accountant General with the journal; but this account also is far too vague and devoid of details to be of use in checking the advances. It contains, indeed, very little more detail than the journal. Instead of shewing separately the advance for each work, it clubs together a number of works, and of course it is impossible to determine the amount for each; and, again, here also we never find the date or amount of the sanction of Government for the work. The following are a few entries taken from these accounts particular.

	Balance re- maining brought for- ward from last month.	Received in this month.	Total.	Paid or cre- dited to other heads in this month.	Balance re- maining in the Treas- ury.
(Octr. 1850.)					
(Canara).—To cash advanced.					
For the execution of Public Buildings.....	2,843 8 7	115 0 0	2,958 8 7	123 1 10	2,835 6 9
For the construction of Bridges.....	2,332 6 9	75 0 0	2,407 6 9	0 0 0	2,407 6 9
(August 1850.)					
(Tanjore).—Repairing Talook Cutcheries.....	1,705 4 0	0 0 0	1,705 4 0	0 0 0	1,705 4 0
Repairing the Jail at Negapatam.....	24 0 0	0 0 0	24 0 0	0 0 0	24 0 0
Repairing old Ferry boats.....	1,563 11 10	31 5 0	1,594 6 10	0 0 0	1,594 6 10
Making new Ferry boats.....	2,033 2 8	0 0 0	2,033 2 8	0 0 0	2,033 2 8
(Sept. 1850.)					
(Bellary).—Advanced for the repair of Roads.....	11,107 7 0	0 0 0	11,107 7 0	491 10 4	10,615 13 5
Do. for the repair of Native Cutcheries.....	1,453 5 3	0 0 0	1,453 5 3	0 0 0	1,453 5 3
Do. for the repair of Revenue Buildings.....	4,143 4 9	219 8 0	4,362 12 9	0 0 0	4,362 12 9
(Decr. 1850.)					
Advances for repair of roads.....	12,323 0 11	607 12 0	12,930 12 11	0 0 0	12,930 12 11
(Decr. 1850.)					
(Salem).—Advances for repairs of roads in different Talooks.....	21,030 12 0	0 0 0	21,030 12 0	0 0 0	21,030 12 0
(May 1850.)					
(Malabar).—By cash advanced for repairs of roads.....	1,583 13 8	1,936 2 0	3,519 5 8	35 0 0	2,584 5 8
(April 1851.)					
(Coimbatore).—Amount sent to different Talooks for repair of roads and tools.....	13,441 11 0	605 10 0	14,046 11 0	0 0 0	14,046 11 0

These extracts are taken at random; the list might be lengthened indefinitely, but this is enough as a specimen. It will be seen that thousands of Rupees are set down as advanced for an indefinite number of works, without any detail in any case, as to the particular work or works referred to, or any citation of any sanction of higher authority for undertaking the work or making the advance.

With reference to what is said above as to the practice in certain Districts of debiting advances for buildings, not as "advances" but at once as "charges," we may add that in Cuddapah and Salem this practice is so universal that the "Account Particulars" of those Districts so far as we have examined them, contain no entries whatever of advances for buildings, because in fact all such advances have been already debited as charges. In Chingleput the practice varies, such advances are sometimes debited as advances and sometimes as actual charges.

441. In the system of advances for Public Works in the Revenue Department as here detailed, we notice a direct variation from the practice in the Military Department on two important points. In the last named Department, as we have seen, all advances for Public Works, are debited to the personal account of the Executive Officers receiving them, and following that analogy it might be supposed that the similar advances in the Revenue Department would be placed to the personal debit of the Tahsildars who receive them and direct the execution of the work. This however is not the case; under special orders from the Honorable Court of Directors, the advances

The monthly account particular; it is far too vague to be of use.

To what head the advances are debited.

ees in the Revenue Department are debited to the Collector and that not individually but by his official designation.

Again, as regards the receipts given for the amounts advanced. In the Military Department they go up to the Accountant General every month with the Paymaster's Journal, as vouchers for the debits entered therein; in the Revenue Department the Tahsildars' receipts for the advances do not go up to the Accountant General in support of the advances made by the Collector, but remain on the records of the Collector's own Office.

442. There is still another feature in the system of the Revenue Department which must be noticed. Sums of money are sent by the Collector to the Tahsildars for the execution of Public Works, and such sums are debited in the Collector's accounts as "advances" on the very day when they leave his Treasury. But they are not in fact then advanced for the works, but are merely transferred to the cash chest of the Tahsildar to be advanced by him from time to time, as may be found expedient. In point of fact in many cases large sums lie in the Tahsildar's hands for months in this way. The estimates for the ordinary repairs of irrigation works are large, amounting in four or five Districts, as already noticed, to from 50,000 Rupees to 80,000 Rupees a year: it is usual to send to each Talook at the commencement of the season, half the amount of the estimates of the Talook; so that a Tahsildar must often receive 5,000 Rupees on this account. In the case of every occasional work too, a moiety of the amount is usually sent to the Tahsildar; or if the work is small, the whole is sent at once. But we have already seen what long delays occur in commencing work, and even in making the advances at the Talook Cutcherry; and all this time the cash is lying in the Tahsildar's hands, and has already been debited in the Collector's accounts. In the Military Department indeed, and in the Road Department as we shall see presently, the executive officers receive advances of money, out of which they themselves make advances for materials and for labour; but those officers, in both cases, limit their drafts to their immediate wants, and they are members of Departments exclusively employed on Public Works, and no other means appears by which they could be supplied with the necessary cash. But the case of the Tahsildar is different: he has ever been regarded less as an Executive Officer than as the general Administrator of the Talook; instead of belonging to a separate Department from the issuer of the money, he is his immediate official subordinate; and he also has a general cash chest, from which he might make his advances to the parties directly performing the work, debiting such advances at the time of actually issuing them. It is therefore unnecessary that he should have in his hands any funds set apart out of the general cash in his charge for a future contingency, and it has ever been thought objectionable to leave such deposits in the hands of Tahsildars. We shall recur to this subject by and by.

443. Thus much of advances in this Department; we must now describe the mode in which they are adjusted. After a work is completed, the bill is prepared in the mode already spoken of in Section III. In due course it goes up through the Civil Engineer to the Board of Revenue, by whom after examination and audit, it is submitted for the sanction of Government. That sanction having been accorded, a copy of the order containing it is sent to the Board; and the order itself is sent to the Accountant General's Office, whence it is returned after a copy has been taken. By the former of these two authorities the sanction is notified to the Collector and to the Civil Engineer. In the Accountant General's Office it is entered in the General Sanction book before spoken of, which contains all sanctions of whatever kind communicated by Government to the Office. Nothing further is done with the sanction in the Accountant General's Office, and it is probably never referred to again; for from the vagueness and absence of detail in the Collector's Journals, as above described, that Office is entirely without the information necessary for turning it to account in checking the Collector's adjustment of the advances, as we proceed to show.

444. In general, advances for Public Works by the Collectors are adjusted after the actual charge for the work has received the Sanction of Government. On intimation of such Sanction reaching him through the Board of Revenue, the Collector adjusts the amount of the bill in his Journal for that month, by crediting the head of advances to which the amount expended stood debited, and debiting the proper head of charge. The Collector's journal goes to the Accountant General's Office every month, but in that Office it is not the practice to journalize the transactions every month, but only once for the whole official year. Very little is done therefore with

The receipts do not go to the Accountant General.

Large sums lie in the hands of the Tahsildars.

Adjustment of Advances in the Revenue Department.

The Accountant General is without the means of controlling it.

the Collector's monthly journals till the close of the official year; and then, the closing entries in the Collector's journals are adopted without question, and transferred to the same heads in the General Territorial Journal. No sort or degree of examination can be exercised by the Accountant General to see whether the adjustment of advances is properly made, for want of the necessary points of detailed information. He is unable to examine whether the amount debited agrees with the bill or with the sanction; whether it exactly adjusts the advance or is something more or less, and if the latter whether the excess or deficiency has been duly adjusted; or lastly whether the debit is charged by the Collector to the proper head of account. All such scrutiny and check by the Accountant General in this Department is impossible, in consequence of the scantiness of the information furnished by the Collectors; and in default of more detail from them, the communication of the sanction to the Accountant General is utterly useless.

445. In order to enable the Accountant General to use that document in checking the Collectors' adjustments of advances, it would be necessary that the latter Officers whenever making an advance should specify in their Journals the precise works for which made, and the exact amount for each work, and should quote the sanction for each, special or general as the case might be; and also that whenever making an entry in adjustment of any such advance, they should in like manner particularize every work concerned, and should make a separate adjustment for every work for which there was a separate entry of advance, and that as before they should quote the sanction for each work. All this is carefully done in the Military Department; and the Accountant General by duly registering and arranging the information thus supplied, is able to check both the advances and the adjustments. In the Revenue Department on the other hand, none of these particulars are furnished; or at least, if any of them are ever given, it is not regularly and systematically, but occasionally and as it were accidentally; and in every District, without exception, the information is far too wanting in detail to give any means of check. We have already described the mode in which the advances are exhibited in the Collectors' Journals, the entries of adjustments are even more vague, a large number of works of various kinds are frequently entered in a single line, with no detail as to the particular works included in the entry, or even as to their number or their nature; and without any reference to the advances made, and often not even to the bills sanctioned. And the sanctions themselves as communicated to the Accountant General are equally vague and indefinite. It is true that by applying to the Board of Revenue that Officer might obtain information as to the exact nature of the works sanctioned, and the amount for each; but in the absence of detailed information from the Collectors both as to the advances and adjustments, this information would be of no use, and as a fact it is never applied for.

446. The following are a few examples of the mode of adjusting the advances in the Revenue Department, taken at random from the Journals of several Collectorates.

	Rs.	A.	P.
(Cuddapah.) Repairs of tanks and watercourses Dr. to Advances for repair of Tanks and watercourses.			
For amount of Bills sanctioned by Government under date 16th July 1849, on account of repairs incurred during the year 1847, for ordinary and extraordinary, less Sibbundy charges.....	17,483	8	0
Cash Dr. to Sundry Accounts:			
Advances for repairs of tanks and watercourses.			
Amount undisbursed and returned from the several Talooks from the amount advanced under this head.....	55	1	4
(Bellary.) Repairs of tanks and watercourses Dr. to Advances for repairs of tanks and watercourses.			
For amount adjusted to the debit of the former, being the amount of works performed in 1848, bills of the actual charges having been sanctioned by Government on 8th November 1850.....	56,785	9	9
Cash Dr. to Sundry Accounts.			
Advances for repairs of tanks and watercourses.			
Received from the Amildars of Hoossnully (and 4 other Talooks named) out of the advances made in Faslies 1254, 1255, 1256, 1257, 1258 and 1259.....	481	8	1
(Tanjore.) Repairs of tanks and watercourses.			
Amount of bills for actual charges on this account.....	1,82,479	9	

Buildings Revenue.

For constructing a Talook Cutcherry at Tranquebar..... 1,098 7 0

Buildings General.

For constructing sheds for the accommodation of European Invalids coming to Tranquebar from Trichinopoly..... 4,194 13 0

(Malabar). Sundry accounts Dr. to Advances on account of the service of Government.

Buildings Revenue.

Charges for building a Salt Gollah at Calicut..... 2,887 6 0

Do. for do. an additional room to the Collr's Cutcherry 207 0 0

3,094 6 0

(Canara). Sundry accounts Dr. to Advances on account of the Service of Government.

Buildings General.

Amount of expenses incurred in building a Civil Dispensary at Mangalore in part of the Estimate sanctioned on 22d April 1850..... 2,398 14 3

Public Roads.

Expenses incurred in completing the Road between Mangalore and Agombah Ghaut, through Goopore, in further part of the Estimate sanctioned under date December 11, 1849..... 3,606 14 1

Here we see very large sums expended on a variety of Irrigation works, and on ordinary, occasional, and emergent work clubbed together in a single entry; and no reference whatever to the particular works in question, and in some cases not even the sanction of Government for the charge quoted. So also in the case of buildings; sometimes a whole class of buildings are massed in a single entry, and even when a building is named the sanction of Government is not quoted. The entries of refunds too deserve notice. In Bellary we find sums refunded from five Talooks in the course of six years, all lumped together in a single entry.

447. Mr. Ramus the Manager of the Revenue Department of the Accountant General's Office was examined by us on this part of the subject at some length, in the presence of Mr. D'Silva the Deputy Book-keeper of the office, and of Mr. Watkins the Manager in the Transfer Department; and he admitted that he took no means whatever to ascertain the correctness of the Collector's entries of advances and adjustments. We took at random an entry which we found in the Journal of the Tanjore Collectorate for April 1852, Page 391, which is as follows. Sundry Accounts Dr. to Advances for Repairs of Tanks and Watercourses.

For amount of Actual Charges incurred on the following accounts, as per Bills forwarded to the Civil Auditor.*

Repairs of Tanks and Watercourses.	Tanjore.	Nagore.	Tranquebar.	Total.
Amount of Bills for Actual Charges on this Account.	1,34,512-12-6	10,004-6-0	3,007-5-0	1,47,524-7-6

This is the whole of the information given to the controlling office, with respect to this very large and compound charge; it specifies no works, and refers to no documents or authority; it does not even show the year or years in which the works were executed. Mr. Ramus admitted that he had no means of knowing whether the large expenditure charged, or any part of it, had ever been passed by the proper office of audit, or sanctioned by Government; whether it agreed with the amount of the bills sent in for the works to which it related, or whether any such bills had ever been sent in at all; that there was nothing in the office to show whether any of the sanctions communicated to the office from time to time had reference to any of the works thus charged for; that, as a consequence, he had no means of knowing whether the amount thus debited was correct; whether (admitting it to be so) it correctly adjusted the advances made for the various works concerned; or whether all these works (probably very numerous) were rightly classed under the head of "Repairs of tanks and watercourses," or whether some of them ought not properly to have been placed

* "As per Bills forwarded to the Civil Auditor;" this is the customary mode of entry in the Tanjore District, but in point of fact no bills for work done are ever forwarded to the Civil Auditor, either before the advances are adjusted or at any time after. We cannot tell for what reason this phrase is employed.

Because the information in the Collectors' Journals is defective.

Examples of adjusting entries from the Collectors' Journals.

An instance as to "Tanks and watercourses."

to some other head. Lastly, he stated that being entirely without the means of determining any of these questions, all of which however closely concern the office of account, and all of which are very carefully attended to in the Military Department of that office, he simply took the entry as he found it, and transferred it without any question or scrutiny whatever, to the General Territorial Books.

It is the same with other works.

448. This case is a fair instance of the system at present followed in the Account Department with respect to the whole expenditure on the Irrigation works of the country, amounting on the average of the past five years to above ten lacs of Rupees annually. As regards the expenditure in the Revenue Department on roads and buildings, somewhat more information, or we should rather say somewhat more show of information, is received by the Account Department, as we have already explained. But still it is so wanting in detail on some essential points, that it is wholly useless for all the purposes of check; and as a fact, no more check is exercised in the case of those advances, than in that of those for Irrigation works. We questioned Mr. Ramis on this point also, and he admitted that no means whatever are used in that office either to see that the charges debited in the Collectors' Journals on these accounts had been duly sanctioned by Government, that they were debited to the proper heads, or that the advances were properly adjusted; and that being thus without the means of testing the charges in any way, he simply took them as they stood in the Collectors' Journals, and transferred them without question to the corresponding head in the General Books. And though he said it was the duty of the Civil Auditor to ascertain that the charges were duly sanctioned, he admitted that the Accountant General's Office did not wait for information to that effect from that officer before entering the charges in the general books, that no such information was in fact ever received, and that no communication of any kind ever passes between the two Offices on the subject.

In some Districts advances are adjusted prior to the sanction of Government.

449. As a proof of the entire absence of control over the advances and adjustments in this Department, and as an instance of its effects, we may quote the practice which we find to prevail in certain Collectorates, with respect to the adjustment of advances. In all the three branches of the Department of Public Works, the rule is that advances for work shall continue to stand as such in the accounts, until the sanction of Government to the bill is received; so that, in this Department, no expenditure shall be admitted into the accounts as a charge, till finally passed. This is the standing rule of the Department, and it might be supposed therefore that no other course would be permitted; that if a charge of this nature were debited in the accounts of any officer prior to the final sanction of Government, it would not be admitted by the controlling office of Account at the Presidency. We find, however, from the replies of Collectors to our Circulars, as well as from the actual examination of the Journals, that in some Districts, viz. in Tanjore, Canara, and Malabar, and in Rajahmundry as respects roads and buildings, advances are adjusted in the accounts and converted into charges, as soon as the bills for the works concerned are made up and sent off to the Civil Engineer, altho' the Government sanction for the charge is often not received for more than a year after. Further enquiry might perhaps show that the same practice exists in some other Districts besides those above named.

And the Accountant General has no means of detecting this.

450. Previously to going into the system in this Department of the Accountant General's Office we were at a loss to know how charges thus debited in contravention of its rules, could be allowed there; but on examining that system we found that under the circumstances above set forth, the Accountant General is entirely without the means of knowing whether the bills for expenditure charged in the Collectors' accounts have been passed, or even sent up. Mr. Ramis professed himself certain that Collectors only adjust advances for Public Works after obtaining sanction to the bills, and that the large charge of Rupees 1,47,524-7-6 above spoken of must therefore have been sanctioned; but he admitted, when pressed, that he had no certain knowledge as to the practice, and he had nothing to say when we told him as a fact, and that on the authority of the Collector himself, that in Tanjore it is always the custom to debit such charges without waiting for the Government sanction.

Again, we have spoken above of the practice which we found prevailing in some districts, of debiting advances for buildings, and in some districts for roads also, at once at actual charges, sometimes before the work has been begun, and generally before it has been completed or the real charge ascertained. This practice also has attracted no notice in the Accountant General's office; and although it is immediately apparent on an inspection of the journals of those districts, yet the

Manager of the Revenue Department, who is specially charged with the duty of examining those Journals, was not even aware of its existence.

451. There is another item in the adjustment which we must notice. It constantly happens and must happen that some part less or more, of the advance sent to the Tahsildar for a work, remains over the expenditure, and is returned to the Collector's Treasury. In the Military Department this occurs also; and as we have pointed out, the surplus is then repaid to the Paymaster, whose receipt accompanies the bill for the work; and by that means the Accountant General is enabled exactly to ensure the correctness of the transaction. In the Revenue Department the Accountant General is without any such information. The unexpended part of the advance is returned by the Tahsildar to the Collector's office, and is there recredited in the accounts to the same general head to which the advance was debited, i. e. either "Advances for repair of tanks and water-courses" or "Advances on account of the service of Government"; but it now here appears to be the practice to give the name of the work for which the advance was made or other particulars. The entry very generally describes the refund simply as received from such and such a talook, being unexpended balances of advances. Thus the entry appears in the Collector's journal; but it may be a year or more before the bill for the work concerned receives sanction, or on the other hand the refund may not be credited for years after the work is finished and the bill sanctioned. Thus there is nothing before the Accountant General to connect the two transactions, and he is utterly without the means of knowing whether the adjustment is correctly made. As instances of the mode in which these refunds are brought to account, we beg to refer to the extracts of Journals given above in para 446; in one case there given, (from the Bellary Journal,) we find, as already noticed, refunds from five Talooks for six years, massed together in a single entry.

There is no check over the refund of unexpended advances

452. There is still another portion of those advances, as to the recovery and adjustment of which the Accountant General is left still more in the dark. It happens not unfrequently as we pointed out in our First Report, that a part of the Tahsildar's charge for a work is disallowed by the Civil Engineer, and the amount is ordered by the Collector to be recovered from the parties who performed the work. In some Districts it is the practice, as above noticed, to retain a part of the amount due to the workpeople to meet any such retrenchment; but this very objectionable practice is by no means universal, and in other cases the amount has to be actually recovered. Now the Accountant General has no information of the retrenchments, or of the balance outstanding on this account: nor does he know any thing of the recoveries except as they appear credited in the Journal; and as he has no previous knowledge, he is without the means of checking them even then. And as the office of Account is thus without the means of securing the adjustment of this part of the advances, so the Board of Revenue take no measures to secure their recovery; they receive no returns of their amount, or of the collections made, and appear to have no systematic knowledge of them. Thus these outstanding advances are left entirely to the Collectors; and as might be expected, they appear to be recovered with more or less regularity in some Districts, but to be very much overlooked in others. We obtained from the Collectors returns of these outstanding advances from which it appears that their aggregate amount up to the close of Fusly 1259, (1850-51) is Rs. 23,279-3-5 in fourteen Districts. In Appendix L we give a Statement showing the amount in each District and in each year. It will be seen that the heaviest arrears are in Bellary, Nellore, and Tinnevely; viz. 6,769 Rupees in Bellary, 4,906 Rupees in Nellore, and 3,917 Rupees in Tinnevely. In the last named District the arrears extend back as far as 1811; in Nellore they date from 1812, and in Bellary from 1819. In Coimbatore also there is a small sum outstanding since 1820; in the other Districts the arrears are much more recent. We cannot but regard that system as seriously defective, under which these long outstanding advances, so numerous and to so considerable an amount, could remain unknown and undistinguishable among the mass of unadjusted advances, so that the head office of account should be in entire ignorance of them.*

Or over the recovery of sums overpaid.

* The Collector of Bellary sent us together with the Memo. of advances outstanding, another Memo. of sums due in his district to parties for work done on Public works. From this it appears that no less a sum than Rs. 15,339-9-0 is borne on the books of that Collectorate as due to workpeople on that account. There are sums due for every year since 1818; and a very large part of the whole viz. 14,139 Rs. is due for years prior to 1841. The Collector does not inform us how and why these sums have remained unpaid, and whether they are sums disallowed; but he expresses the intention of shortly bringing the subject before the Board of Revenue, with a view to the final settlement of the claims and dues shown in both Memos.

The present Accountant General has made some endeavour to control the adjustments.

453. Since the accession of the present Accountant General to office he has directed some attention to the object of expediting the adjustment of advances outstanding in the Revenue Department. With that view he called on all Collectors by Circular, so long ago as the 18th July 1845, to furnish a Statement of the "advances for the service of Government" outstanding on the 30th April preceding, showing separately the amount for which bills had been submitted for work done, the amount for work completed, but for which bills were not yet sent in, and the amount for work not yet completed. Similar statements have since been received every year. These statements are not in much detail. They generally contain only single entries for whole classes of works; such as "for repairing Travellers' bungalows" "for repairing roads," "construction of bridges" "repairs of revenue buildings" &c. The names of the buildings, bridges, or roads, and even the number of such works, are not given, nor do we find the sanction of Government to the estimate quoted, in any of those which we have examined. They state however in a general and vague way the time when bills were submitted; or where no bills have been yet submitted, the time when the advances were made. They are useful therefore, to some extent, for the object immediately aimed at, viz. to inform the Accountant General in what cases advances have been very long outstanding, or bills have remained very long unsanctioned.

On the information supplied by these statements, the Accountant General on the 20th March 1850 addressed the Government, bringing to notice a number of cases in which advances had been outstanding for very long periods, as well as others in which bills had been sent in a long time, but not yet sanctioned. Explanation was called for by Government from the Board of Revenue and was supplied; many of the oldest advances had been adjusted in the meanwhile, but no reason for the delays was given, except that the Board justified those in their own office, by declaring that with their very insufficient establishment such detention was unavoidable.

454. In a former letter dated March 21, 1846, replying to some observations of the Government on the delays occurring in the adjustment of advances, the Accountant General had explained that the duty of bringing to adjustment advances for Public Works in the Maramut Department rested with the Board of Revenue; and that although, since he assumed charge of the office, he had endeavoured to expedite such adjustments, such control by him was only supplementary and additional; and did not absolve the Board from the duty of bringing the advances to an early adjustment. The Government in their reply (resolution of 2d April 1846) recognized that representation as correct, by issuing injunctions to the Board of Revenue and the Court of Sudder Udaulut to use all means to prevent delays. So also with respect to the Accountant General's second letter of March 28, 1850; the final order of Government (28th November 1850) appears to take the same ground, and rather to discourage the interference of the Accountant General, directing him in future to address the Board of Revenue in such cases and not the Government. In this point, ing out the delays in adjusting advances, therefore it is not our intention to impute blame to the Accountant General's office, which appears to have performed the duty assigned to it in this regard. We may add that the Accountant General has not addressed the Board of Revenue on the subject of any long outstanding advances; but has continued to write to Collectors from time to time.

We must observe lastly of the yearly Statements of outstanding advances now received by the Accountant General, that they do not in general comprise the largest class of such advances, viz. those for irrigation works. Some few Collectors indeed appear to include in them advances of that character, though often only in a single line; but the Accountant General's Circulars calling for the Statements have no reference to such advances, which are therefore as entirely uncontrolled as ever.

455. We thus find in the Revenue Department a great want of control over the advances, and of that means of ensuring their being duly brought to adjustment, which we cannot but think there ought to be. In order to that object the office to which this duty of control may be entrusted ought to have full notice of the amount of disbursement allowed in any case by the sanction, whether special or general; and of the advances made on that account; and complete information and at the proper time, of the means by which the adjustment is to be made, whether by sanctioned bills, or by refund. All this information the Accountant General has in the Military Department but not so in the Revenue. The notice which he receives of sanction for disbursement is defective, because it does not give separately the amount of each estimate sanctioned. The information furnished by the Collectors, both as to the advances made and the adjustment of those advances by

But the Government rather discouraged such endeavour.

Thus there is great want of control over the advances and adjustments in this Department.

bills, is so vague and wanting in necessary detail as to be utterly useless. And as to the Accountant General's knowledge of the amounts sanctioned; the bills themselves do not come to him as they do in the Military Department, and even the sanctions of Government do not show the amount, or even the name, of each work sanctioned, but only the aggregate amount. And there is no accompanying information whatever as to the agreement of the sanction with the advances made, or of the adjustment of any difference that may exist.

We shall detail presently the mode by which we propose to ensure that check and control over the advances and their adjustment in this department which is now so entirely wanting. We shall recommend that this duty should be assigned not to the Accountant General but to the controlling Board of the department; because it appears to us to be a departmental duty properly devolving upon them; because we think such departmental details are foreign to the province of the general office of account for all departments; and because though that office is able to perform this duty for the small Military branch of Public Works, it would hardly be capable of effecting the same for the whole department. The work of the Board in this particular, however, should be brought under the review of the Head office of Account.

456. It is striking to contrast the system in the Revenue and in the Military Departments with regard to the checks imposed. In the latter the advances are made by the disbursing Officer to a totally distinct and independent Officer who renders separate accounts to the Accountant General; and each separate advance is only issued, after the receipt of special authority from the Accountant General. Yet in that Department the Accountant General is furnished with authority and with means fully to control the adjustment of the advances. In the Revenue Department on the contrary, the advances are made, as to time and amount, entirely at the discretion of the disbursing Officer, and not to a separate and independent Officer but to his own subordinates. It might be supposed that in this case, extra care would be thought necessary to ensure the due recovery or adjustment of the advance; but on the contrary we find that the means of check so strictly applied in the Military Department, where the functions of payment and receipt are kept entirely distinct, are wholly neglected in the Revenue Department where the same individual is both disbursing and receiver.

Contrast between the Revenue and the Military Department in this respect.

PART III.—THE ADVANCES AND ADJUSTMENTS IN THE ROAD DEPARTMENT.

457. The system of advances in the Road Department was devised, and prescribed to the Superintendent, when the Department was first constituted in 1846, by the Accountant General who furnished the forms of the books to be kept. In its general features it resembles that of the Revenue Department; the chief difference being that the Superintendent having no Treasury of his own, as the Collector has, draws the funds that he requires from the latter Officer. With the view of obtaining an exact view of the practice, we procured from the Collectors of North and South Arcot, Nellore, and Chingleput, in all of which Districts much work is done by the Road Department and which together comprize much more than half of the aggregate expenditure of that Department, detailed descriptions of the course pursued in their respective Districts, with specimens of the accounts, drafts, reports, &c. in use. The following description is drawn up from those materials. It will be seen that the practice varies on some points in the several Districts.

The general features of the system.

458. When money is required for the execution of work, the Superintendent of Roads sends to the Collector of the District in which it is to be done, his receipt for the sum wanted; requesting him at the same time to place the amount to his credit in the cash chest of some particular Talook where he may require the money, to be drawn for by him as he may find occasion. The Collector

The Superintendent obtains money from the Collectors.

issues his orders accordingly to his Treasurer and to the Tahsildars concerned, and in most Districts the amount of the Superintendent's receipt is at once debited in the Collector's accounts although not actually paid out till some time after. The sums thus taken up by the Superintendent in any one Talook are usually from one thousand to three thousand rupees; and having this credit in a Talook the Superintendent empowers his assistants, who are the executive officers of the department, to draw upon it. The means by which this power is conveyed is by a draft or order addressed by the Superintendent to the Tahsildar, desiring him to pay to the Assistant Superintendent the amount just placed to his (the Superintendent's) credit in the Talook Treasury. The Assistant then draws on the Tahsildar from time to time, in virtue of the credit so given, in favor of Overseers or others, as may be convenient.

459. There appears to be no check over the Superintendent's drafts on Collectors. The authority for making such advances is an Extract Mins. of Cons. May 2, 1846, authorizing Captain Best, (then provisionally in charge of the Trunk Roads, pending the confirmation of his appointment and of the formation of the Road Department by the Honorable Court of Directors,) to draw on the Collectors for such sums as he might require. This order, and a letter from the Accountant General dated March 30, 1846, notifying to what head these advances are to be debited, are the only instructions which a Collector has on this point. He does not receive any information from Government, nor does the Accountant General, as to estimates sanctioned in the Road Department. The Superintendent himself, indeed, sometimes thought not always, sends to the Collector a copy of the sanction on which he draws; but this cannot serve as a guide to the Collector in limiting his advances, because a sanction often includes work to be done in two or more Collectorates. Neither is it intended for that purpose; the sanction is communicated, or not at the Superintendent's discretion, and if he sends it, it is merely an act of courtesy. The Collectors consider that it is not their duty in any degree to judge of the propriety of the Superintendent's drafts upon them; but merely to honour those drafts without reference to their amount or object.

460. The amounts of the Superintendent's receipts are at once debited in the Collector's accounts, as already said, and placed at the disposal of the Superintendent, in the hands of the Tahsildars respectively indicated by him. If there is not at the time sufficient money in the Talook Treasury, the amount is sent for this purpose from the Collector's own Treasury; but if there is enough, it is the practice in some Districts to direct the Tahsildar to take the amount out of the funds in his own Treasury. The Collector debits the amount in his Journal to the head of the Superintendent of Roads; in some Collectorates the receipts given by the Superintendent are sent to the Civil Auditor, in others it is the practice to retain those receipts on the Collector's Records. The Superintendent gives the Collector a corresponding credit in his journal, which like that of the Collector is sent monthly to the Accountant General. It is accompanied by an account particular of advances, similar in form to that already described as sent with the Collector's Journal, of advances in the Maramut Department; but more systematically drawn up, inasmuch as it shows separately the advances made under each sanction. It is defective however in wholly omitting to quote the sanction, which omission would preclude any checking of the advances by the sanction in the Accountant General's Office, even if the latter were communicated to that office, which is not.

As regards the payment of the drafts on the Tahsildar it does not appear that any means are generally taken to check or verify them. The drafts themselves, which are the vouchers to support the Tahsildar's debits, are not sent up by him to the Collector except in the case of South Arcot, where they are sent up at the end of the month, and returned after comparison with the debits. So also there does not appear to be any systematic interchange of information between the Collector and the Superintendent with respect to these drafts; nor is any account of payments made upon them furnished to the Superintendent, either by the Collector or by the Tahsildar.

461. The system of obtaining advances in the Road Department as here detailed contains no little irregularity and confusion.

In the first place the debit is made in most Districts as soon as the "receipt" of the Superintendent reaches the Collector; though the amount is not paid out for some time, and then generally in several separate sums. Thus the debit does not represent an actual transaction but a fiction, and so infringes one of the very first principles of accountancy.

There is much confusion too in the mode of drawing the cash. The money is first placed at the credit, and at the disposal, of the Superintendent; he gives credits upon it to his assistants, who again give cheques within such respective credits to their Overseers or others, and these cheques, often for inconsiderable sums, are in the case of one of the Assistant Superintendents at least, drawn payable in any portions that the parties favored may find convenient. Thus the Tahsildar is obliged to open a separate account, not only for each credit given by the Superintendent on the sum at his disposal, but also for each cheque drawn by an Assistant Superintendent in virtue of such credit. In this part of the business the Tahsildar acts less as a servant of the Collector than of the Superintendent of Roads; he is in fact made the Accountant of this latter Officer to keep the accounts of the funds at his disposal, and it appears objectionable to place him in this relation of an Officer who has no control over him. Further the existence of a deposit fund of this kind in any cash chest is an evil, and is open to objection, because likely to lead to serious abuse.

462. Under the peculiar constitution of the Road Department, viz. the Superintendent being sometimes at a distance of several hundred miles from the place where the money is required, it is perhaps necessary that he should thus give credits to his assistants for much larger sums than they need to draw at once. But the complication and confusion which we have noticed might be avoided by a better system of accounts. In the first place, instead of getting a credit for himself on a Talook Treasury, and then transferring that credit to his Assistant by a separate order to the Tahsildar, the Superintendent may at once have the money placed to the Assistant's credit; 2d the Assistant's drafts should always be drawn for the sums actually wanted, and should be paid at once, instead of by instalments; and 3d the transactions being thus simplified, an Account Current prepared monthly will at once exhibit and certify the exact state of matters between the two Offices. The system in use as respects the transactions between Collectors and Paymasters, furnishes a model here. Paymasters obtain cash from the Collectors on letters of credit issued monthly by Government. At the end of each month the Collector prepares in duplicate an Account Current showing the credit, the amounts drawn, and the balance; this account is sent to the Paymaster, and being examined by him and found correct, is countersigned and returned to the Collector, by whom one copy is sent to the Accountant General and the other to the Civil Auditor with his monthly journal. In like manner an Account Current of the credits and drafts of each Assistant to the Superintendent might be prepared monthly by the Collector and sent up with the countersignature of such Assistant, and this would effect that periodical comparison of accounts between the two departments which seems to be now wholly wanting. With the new arrangement of the executive however which we have proposed, the system will be still more simple. The District Engineer being always at hand will not require to give such credits, but will give his Executive Agents drafts for such sums as they actually require.

463. With regard to the check exercised in the office of account over the advances in this department; we have said already that the Accountant General receives no notice of any expenditures sanctioned for the Trunk Roads, and he is therefore without the means of comparing the advances with the amounts sanctioned.

Again, neither the receipts given by the Superintendent to the Collectors for the sums advanced by them respectively, nor any acknowledgment from the officers who actually receive the money paid on those receipts, are sent up to the Accountant General in support of the debit in the journal.* Some Collectors as we have already mentioned retain the receipts in their own records; while others send them to the Civil Auditor, who as it appears to us has no concern with them, as they relate to advances only and not to charges. No instructions appear ever to have been sent to the Collectors on this point, either from the office of Account or of Audit; and the variation of practice shows how little attention has been paid by the Presidency officers, to the due regulation of the new department. The drafts drawn by the receiving Officers, which are their acknowledgments of receipt, are for the most part as already mentioned not sent even to the Collector's Office, but remain in the Talook Cutcherry.

* Since the above was written, we have learnt from one of the Collectors that he has been instructed by the Accountant General to send up the Receipts of the Superintendent of Roads, in support of the debit in his Journal. Similar instructions have probably been sent to the other Collectors who have transactions with the Superintendent of Roads.

Improvements suggested.

Little check over the advances in this department.

The Journals of the Collectors and of the Superintendent are not compared.

464. One means of checking the advances in this department is indeed in the hands of the Accountant General, viz. by comparing the debits in the journal of the Collector with the credits in those of the Superintendent; both journals being received monthly in his office. On making enquiry in the Accountant General's office whether this comparison is really made, we were at first assured by the Manager of the Revenue Department (to whose duty it falls) that it is, but further enquiry showed that it is not, or at least not to any useful purpose.

It appears to be the practice in the Revenue Department of the Office to examine the journals received from the Collectors, and any errors or discrepancies found are entered in a register; and every two or three months each Collector is furnished with an extract of so much of this Register as relates to his District, for explanation or correction. In the same way we were assured that the debits found in the Collectors' Journals of advances to the Road Department, are compared with the credits in the Superintendent's Journals, but no mention of any such discrepancies was found in the "Register" to support this assertion. At our request the debits to the Superintendent in the journals of several Collectors were compared with the credits in the Superintendent's journal for several years, and the discrepancies found were very numerous and of considerable magnitude. We could not forbear the inference that in point of fact the comparison had never been made before; and it was admitted by Mr. Ramus that no communications respecting such discrepancies had ever issued from the Accountant General's Office. We may remark that these discrepancies between the amounts debited in the one journal and credited in the other were owing to the debit and credit not being made in the same month. This difference arose in some instances from the amount of receipt given by the Superintendent being disbursed by the Collector in several payments, debited from time to time as they were made; but in general because the Superintendent gave the Collector credit for the amount of his receipts as soon as he dispatched them to that Officer, while the latter only debited the amount when actually disbursed, which was often in the following month. In either case the remedy was easy, and would probably have been applied without delay, if the matter had ever been brought to the knowledge of the Accountant General. In the latter case, it would only have been necessary to direct that the Superintendent also should give credit for the advance only when actually disbursed to him, or placed to his credit by the Collector; in the former, a Memo. showing the undrawn balance of the Superintendent's receipts, sent with the Collector's journal, would furnish the necessary explanation.

Nor the total amount of the Superintendent's drafts checked.

465. Another check which the Accountant General might have exercised over the advances in this Department is in taking care that the advance in any one year did not exceed four lacs of Rupees, the limit prescribed in Minutes of Consultations of Government January 27, 1846, when the Road Department was constituted. That limit having been fixed, it might be supposed that it naturally became the duty of the Head Office of Account to see that it was not transgressed; but no means have ever been taken in the Office with that view. It appears to be the feeling in that Office indeed that this duty does not rest with the Accountant General but that the Superintendent is himself to check his own drafts; and this interpretation of the intentions of the Government, however contrary to sound arrangements, is countenanced by the terms of the order, of which the seventh para. is as follows.

"The expenditure upon the great Trunk Roads and the Lines of Road, as pointed out in the Minute of the President quoted in this Despatch, is never to exceed the sum of (4) four lacs of Rupees annually. This amount will be held for this purpose at the disposal of the Superintendent, and he will be responsible that it is on no account exceeded."

We will not undertake to say what was really meant in this passage: the construction put on it in the Accountant General's Office agrees with the intention traceable throughout the constitution of the Road Department, to make it subordinate to the Government alone, and independent of all inferior authorities. As respects the advances in the Department generally, also, we may observe that the same opinion appears to prevail in the Accountant General's Office as regards this department, which we have before mentioned as existing there with respect to the Maramut Department, viz. that the Accountant General is not expected to exercise any check or control whatever over them.

Adjustment of advances in the Road Department.

466. The mode of adjusting the advances in this Department is very similar to that of the Revenue branch, and therefore need not be detailed at any length. The bills for work done are sent up by the Superintendent to Government; and when they are passed, a copy of the sanction

sent to that Officer is communicated to the Accountant General. The Superintendent then adjusts the advance, by crediting the head under which the advance was made, (which was that of an advance for the particular work or rather of the particular sanction) and entering a corresponding debit to the same work. When the Journal comes up to the Accountant General's Office these entries are verified by comparing them with the sanctions received from Government. For this comparison, which is impracticable in the Maramut Department for want of detailed information in the Collectors' Journals, is simple and easy in the case of the Road Department, in consequence of the different mode of making the adjustment in that Department, viz., the advances under each separate sanction are always shown distinctly from those under other sanctions, and in like manner the bills for the works under every sanction are always sent up separately, and after they are passed the advances are adjusted by a separate entry in the journal. The date of the Government sanction is quoted in that entry, and the Accountant General is thus enabled to refer to it without difficulty and so to verify the adjustment so far as regards its total amount. The Superintendent's monthly account particular of advances also shows separately (as already said) the advances under each sanction. But the sanction not being quoted or referred to there, the account particular is useless for the purposes of comparison; and for want of this trifling addition, the Accountant General's Office is without the means of assuring itself that the advances made on each sanction are correctly adjusted by the bill. Contrary to the practice of the Revenue Department the bills themselves, after being passed by Government are sent to the Accountant General's Office for deposit; but it does not appear that they are made any use of in verifying the entries in the Superintendent's Journal.

467. Thus we find in this department the same absence of a due cognizance of the state of the accounts on the part of any controlling office as in the Revenue branch last remarked on. Both departments spend large amounts of public money, and the keeping regular and systematic accounts of that expenditure is one chief part of the duty of both. Yet in both, the control over the expenditure by the requisition of proper accounts is very much wanting. With regard to the Road Department, the only office which under its present independent constitution could exercise any such interference, is that of the Accountant General. But as respects one principal part of the transactions, viz. the advances, that office is left without the means of ensuring that proper accounts are kept, and even considers itself absolved from the task of doing so. And as respects the final adjustment of the advances, though that office is apparently expected to secure its being rightly made, it is left without the necessary information. The remedial measures to be brought forward below will be proposed for Public Works of all kinds, and so will include those now carried on under the Road Department.

Thus the accounts of this department also are under no due control.

PART IV.—THE CHANGES PROPOSED.

468. We have thus detailed the present practice with respect to advances for Public Works, and the adjustment of those advances, in each of the three branches of the Public Works Department; and in this part of the system, as in other parts, we find a striking want of uniformity in the arrangements of the three branches. We fail to see in the circumstances of the case any sufficient reason for these variations; on the contrary we find the strictest system of checks on the disbursement of money just where the organization of the department itself affords the greatest security; and the most entire absence of such check, where there is the least in the constitution of the department itself. We are led therefore to attribute these variations to the absence of a common head to the department, which could take a general view of it in all its parts, and correct one by the experience of another. We have carefully examined the arrangements and the working of all,

Want of uniformity at present.

and we now proceed to propose such changes as seem to us to be desirable. And we would observe here that our propositions will involve but little of novelty; they will chiefly consist in simplification, and in the application and adaptation to one Department, of arrangements found by experience to work well in others. We may add that in our propositions we shall assume that there is to be a skilled executive in the provinces, for the execution of work in all departments and of all kinds, as recommended in an earlier part of this Report.

Advances; detailed restrictions are injurious.

469. We begin with the subject of advances. We have detailed the limitations on the issue of advances in the Military Department at present, and the multiplied references and orders that are necessary before each advance required can be obtained; and we have pointed out the entire absence of such restrictions in both the other Departments. The arrangements of the first named Department in this particular are certainly a source of much inconvenience, waste of labor, and delay; and on the other hand we are unable to see any evil result from the freedom allowed in the other Departments. And if any is anticipated or feared, we are persuaded that the proper mode of preventing it, is not to place difficulties in the way of obtaining the means of carrying on works declared to be necessary; but to give to the proper authority fit means of knowing and of controlling the advances made, and of ensuring their being duly brought to adjustment. Here as elsewhere we think the proper mode for the controlling office to exercise its functions is to lay down general rules and take measures to secure their observance, and not to interfere directly in every individual case.

Advance should be made to the Executive Officer.

470. The recipient of advances should always be the responsible Officer charged with arranging for the execution of the works concerned. In the case of all work in the Provinces, therefore, whether to irrigation works, to roads, or to the buildings of any Department, the officer debited with the advance and accountable for it, would in ordinary cases be the District Engineer. In the case however of a large work, whether Anicut, Canal, Mountain Pass, or other, for which it might be deemed expedient to provide special executive Agency independent of the District Engineer, the advance would be made not to this latter, but to the Officer specially invested with the executive charge of such work.

In the Military Divisions beyond the Frontier, and in the Presidency Division, the executive Officers would receive the advances. In the case of work to be done by contract, the Contractor should be supplied with funds by the Executive Engineer; it seems unnecessary and unadvisable that separate accounts should be opened between the Contractor and the Board of Public Works.

How to be debited.

471. With respect to the head to which advances should be debited, we are of opinion that the practice of debiting the receiving officer by name is productive of inconvenience; the best course in our opinion will be to debit the receiving party by his official designation. This question attracted the notice of the Honorable Court so long ago as 1831, with regard to some other classes of accounts viz. those of Collectors, Political Residents, and others. Prior to that time it had been usual in their case also to show in the Books the names of the individual Officers; but in a Memo. of instructions which accompanied their Despatch of the 26th January 1830 (No. 1. of that year in the Territorial Finance Department,) the Court directed that for the future "The title of the office and not the name of the party holding it should invariably be used upon the General Books."

The following is the whole passage referring to this point. "One point requiring alteration in the Madras General Books still remains to be noticed. The accounts of the Collectors, the Residents, the Post Master General, the Superintendent of Stationery, and other Servants holding offices of trust, are shown on the Books under heads taken from the names of individuals, instead of from the titles of the Offices which they hold. The consequence is that whenever the person filling a particular office has been changed during the year, the number of distinct heads for that office opened upon the Books corresponds with the number of changes which have taken place. The title of the office, and not the name of the party holding it, should invariably be used upon the General Books. When it may appear that an individual upon being removed from an office has a balance standing against him, arising out of his administration of that office, his name will then of course come upon the Books as an individual indebted to the State."

To the Officer by his official designation.

472. The inconvenience here adverted to by the Honorable Court viz. the multiplication of heads of account in the books has been actually felt to a large extent in the Military Department

of the Public Works. The amount expended annually on Works under the Military Board is not more than about two and three quarter lacs, yet, on the average of the last four years, the number of officers standing debited with advances in that department on the 1st May, is eighty-eight, exclusive of seven contractors; see Statement in Para. 187 of our First Report. A separate head of account is kept in the Accountant General's office for every one of those persons. We are not aware of any compensating advantage in the present system for this decided inconvenience. We are of opinion that in this department of the service also the official title ought to be used in the accounts instead of the individual name. An Executive Officer surrendering the charge of his office will deliver to his successor the works in progress, the cash balance in his hands, and his accounts of the distribution and expenditure of the remainder of the advances standing against him, as is now done by the Collectors, the Executive Officers in the Military Department, and the Tahsildars and other officers with respect to the Revenue works. If either at that time or subsequently, any balance shall appear against the officer delivering over charge, "arising out of his administration of the office," then, as the Court express it, "his name will of course come upon the books as an individual indebted to the State."

nation and not by name.

473. With these few general remarks, we now go on to detail the course of proceeding which we propose for the purpose of supplying the Executive Officers with the necessary funds, for exercising due control over both the receipt and application of such advances, and for bringing them ultimately to adjustment. We would observe in the first place that two functions enter into this part of the business; viz. first, to provide that the money required shall be ready when and where wanted, without embarrassment or impediment to the Public Service; and secondly, to control the application of the advances, and their ultimate adjustment. Both these functions come into operation as respects any given expenditure, after it has been authorized by the Government. The first of them certainly belongs to the Accountant General as head of the department of Accounts and of Finance; but the second, as it appears to us, is a departmental duty belonging to the controlling head of the Department of Public Works. Hitherto there has been not a little confusion of duties on this point, as on some others. In the Military Department, as we have seen, the control of the advances and of their adjustment down to the smallest detail, has been in the hands of the Accountant General. In the Revenue and the Road Departments the Accountant General has not exercised any such control, and indeed has not been furnished with the means of doing so; but the defect has been that no other authority has performed the duty. In the Revenue Department the Board of Revenue is the authority on which the duty would properly have devolved; but that authority too has never had the means of discharging it in a real or effectual manner. In the Road Department there is no authority whatever in a position to exercise that control; for the head of the department himself receives and distributes the advances and sends up the bills, and he cannot be the authority to control his own proceedings.

Two separate functions connected with the advances.

474. Without dwelling longer on this point at present, we will proceed now to sketch out the course which we propose for the attainment of the first of the two objects above stated, viz. the provision of funds for Public Works. In order to that, all that is required is that the Accountant General should be duly informed beforehand, with respect to the places where and the times when money will be wanted. This is necessary not in the case of Public Works only, but in the case of expenditures of all kinds; and we cannot be in error if we adopt for this department the same system that is found efficacious in meeting the wants of other departments; in some of which the expenditure is much larger at particular places, and more variable from time to time, than the expenditure in this Department will be. The following is the practice in use as to expenditures generally. Prior to the commencement of each year every Collector lays before the Accountant General an estimate both of the probable income and the probable demands at his Treasury, during the ensuing year; and the Military Auditor General in like manner, sends in a similar estimate notifying the probable requirements of the Military expenditure in every Division. Again, prior to the commencement of each half year every Collector sends in a Statement of the probable condition of his Treasury during each month of the half year, including in it the probable monthly demands of the Paymaster, if any. The object of this latter document is simply to enable the Accountant General to judge of the probable state of the Collectors' Treasury at the end of each month, as well as of the amount, if any, likely to be available for remittance to the General Treasury. These

The financial function; providing the funds.

estimates, the annual and the half-yearly, which are prepared with all the exactness that the case admits of, enable the Accountant General to judge how far the assets in each Treasury will meet the demands and he makes his arrangements accordingly. We propose a similar system, and we may notice that there is the less of novelty in it, because at present the probable requirements for Public Works are actually and specially included in the Collectors' estimates.

The annual financial estimate; by whom and from what materials to be prepared.

475. The annual financial estimate or budget for the Public Works should be prepared in the first place by the District Engineers, and other Executive Officers where there are any. The elements for compiling them will be as follows. First, the ordinary repair of works of irrigation; we have recommended in our First Report that a fixed sum annually should be assigned to each District for this branch of expenditure, and that sum therefore will be the amount of the estimate of the year for this item. Second, every made road will be provided with a permanent annual allowance for its maintenance; and the aggregate of such allowances in each District will form the amount of the District Engineer's estimate for the maintenance of made roads. Third, repairs to buildings; this must be computed with reference to the outlay of former years, and to any special cases that may be expected. Fourth, the sum allowed annually for the District, according to our recommendation above, in Para 48, to be expended at the discretion of the Collector in repairing and improving the country roads. Fifth, so much of the unexpended balances of the amounts sanctioned for new works partly executed in the preceding year, as will probably be expended in the year to which the estimate refers. Sixth, estimates recently sanctioned by Government, or if large, so much of them as will probably be expended within the year. Seventh, so much of estimates about to be submitted as may probably be expended within the year. And, lastly, a sum, larger or smaller according to circumstances, to cover the cost of other works for which estimates may be submitted and sanctioned, and of which the execution may be commenced, within the year. Of these eight parts of the estimate the first four are fixed sums absolutely granted by Government for certain defined species of works, but of which the exact distribution in any year is left to the local officers; the next two comprise the expenditures specially sanctioned by Government; and the last two amounts are contingent on subsequent special sanction.

Through what channel to be submitted.

476. These estimates will be prepared and sent by the District Engineer to the Inspecting Engineer of the Division. Further, there will occasionally be officers in some Districts charged with the execution of great projects, the formation of a pass or a line of road, the construction of an Anicut, the excavation of a Canal, or other, and acting independently of the District Engineer. Every such officer will prepare and send to the Inspecting Engineer a statement of his probable expenditure during the ensuing year. The Inspecting Engineer having received these estimates from his several subordinates, will bring his own knowledge to bear upon them; and having made such modifications as he may think necessary, he will forward them to the Board of Public Works, together with an Abstract showing the whole amount for his Division. The Board will take them into consideration; and having approved them, or modified them if necessary, will compile one Budget for the whole of the Districts of the Presidency and submit it to Government. The Government having approved this budget will transmit it, or a copy of it, with their approval and sanction, to the Accountant General; who will communicate to the several Collectors so much of it as relates to their Districts respectively. We should add however that though it appears necessary to communicate the whole details of the budget to the Head of the Finance Department; yet it is our opinion, as we shall state more fully presently, that the issue of cash for Public Works should be controlled by him only in its total amount, and in all the details of its distribution by the Departmental Board.

Forms for the Financial estimate.

477. In Appendices U to W we give forms for these three documents: viz. the original estimate of the District Engineer, the Abstract to be prepared by the Inspecting Engineer, and the General Budget to be compiled by the Board of Public Works.* In these documents, as well as in all others in the Department, we adhere to the classification we propose to adopt in the final accounts. Without this uniformity of arrangement and nomenclature it will be impossible to

* It does not appear necessary to give a form for the Annual Estimate of the Officers in charge of special works, as they will be very simple; merely showing the amount sanctioned for the works, the expenditure up to that time, and the probable expenditure during the following year.

avoid confusion; while if it is attended to, the accounts of the largest and most multifarious transactions will be simple and clear. Every item may be traced up from its first entrance into the Accounts of any Government Officer to its final position in the Territorial Books; and every charge appearing in the latter may by the opposite process of analysis be resolved into its original elements as they appear in the Station Books. It will be only in rare cases that the whole of the heads of charge will be present, and in very many cases, the majority of them perhaps may be absent: still we have thought it necessary to show the whole in the form for the general budget, and whatever of them occur in any case should invariably be arranged in the same order. In our next Section we shall detail this arrangement more fully. We will only add that it appears advisable for the more complete information of the Government to show in the general budget the corresponding estimates of the preceding year, and the actual expenditure of the penultimate year; the expenditure of the last year will not be obtainable when the budget is submitted, because the year will not be concluded, but that of the first ten months of it may be given. It does not seem necessary however to give these particulars in detail for the several Districts, and to do so would make the budget very voluminous: we therefore propose to append them in an abstract for the whole Presidency, as shown in Appendix W 2.

478. It must be remembered that the annual estimate or budget will not give new sanction to expenditure; it will in the first place bring together and show at one view all the previously sanctioned expenditures likely to be incurred in the course of the year; and secondly, it will state the probable amount of other expenditures likely to be authorized for disbursement during the year. Its use will be two fold. First and primarily, it will apprise the head of the Finance Department what amount will be required in each District for disbursement on Public Works in the course of the year. Second, it will form an authentic standard to the Collectors, whereby to be guided in making advances to the Engineer Department.

Their uses.

To meet this second use, we propose that the annual budget shall be divided into two parts; the absolute and the contingent. Of the eight parts above enumerated the first six will form the absolute portion; the last two will form the contingent. We propose that the amount of the former, viz. of the absolute sanction, should constitute the limit to which a Collector shall advance funds to the Executive Engineer, under subordinate arrangements to be detailed presently. The total amount of the absolute and of the contingent budget should be communicated to the Collector after approval and confirmation by Government; and whenever a further work is sanctioned by Government in the course of the year, the amount of it shall be transferred from the contingent to the absolute part of the year's budget. The notification of the Government sanction, which, for the saving of time and labour, may be made through the medium of the Official Gazette, to be the Collector's authority to make that transfer.

A further use of the Budget will be as a standard of comparison after all the services of the year shall have been completed, to ascertain that the funds granted have been duly applied to the proper objects. We shall advert to this again.

For the half yearly memorandum, it will only be necessary that the Collector should be furnished by the District Engineer, through the Inspecting Engineer, with a statement of the probable amount of his wants in each month of the ensuing half year.

479. Such are all the provisions which on the analogy of other Departments, appear necessary for acquainting the Accountant General beforehand with the demands on the Treasury for expenditure on Public Works. But in order to ensure the timely provision of funds for disbursement exactly when and where required, some previous notice will be necessary also to the Collectors, in their capacity of local Treasurers to the Government. These notifications ought to be monthly; and the following is the mode in which it appears to us they may properly be made. It must be remembered that the whole of the expenditures to be incurred will have already received the sanction of Government, general or special; and the question will not be whether a certain expenditure shall be incurred, or even whether it shall be incurred that year; both these points will have been already determined, and the only question will be, what proportion of the work sanctioned for that year it will be practicable and proper to perform in that particular month of the year. This seems to us to be decidedly a matter not needing the sanction or the previous knowledge of the Government or of any Presidency authority. At present the disbursement of expendi-

Estimates of the amounts required, to be sent monthly to the Collector.

tures once sanctioned is left entirely to the unfettered discretion of the Collector. We propose that the immediate regulation of the advances shall still be left to the local authorities, both as it is they who must in fact determine it, and for the avoidance of delay and useless trouble; but we would lay on the Inspecting Engineer, as the immediate Professional Superior of the District Engineers and the other Executive Officers, the responsibility of ensuring that the drafts of those officers are not larger than the works in hand require. We propose that prior to the close of each month, the District Engineer shall send to the Inspecting Engineer a statement of his probable expenditure during the following month, on each of the several classes of works; and that the Inspecting Engineer shall thereupon, after examining that statement and if approving it, authorize the District Engineer to draw cash to that amount in the course of the month, and shall inform the Collector that he has given such authority.

The materials on which they will be based.

480. The information as to the requirements of the month must come from the District Engineer; and under the system of accounts which we have sketched in Section II, he will have authentic means of supplying it. It is proposed as above stated that the Districts shall be distributed into divisions, each being under a Sub Engineer, an Overseer, or in some instances a Superintendent of Maramut, to all which classes in this relation we have given the common term of Executive Agent; who will arrange for the execution of work, and visit in turn all works under execution, to cash tickets and make payments as well as to direct the operations. Under these officers there will be Maistries, or Foremen as we propose to call them, either in charge of single works of some magnitude, or superintending a small circle of works of inferior size and importance, but not in either case charged with the disbursement of money.

The Executive Agent constantly visiting the works in succession, and being thus acquainted with their condition and rate of progress, and knowing from his cashbook the actual expenditure already, will be able to estimate that of the ensuing month with much accuracy. On the 20th of every month, he will send in to the District Engineer a list of all the works in progress, stating for each one the amount sanctioned, the expenditure up to that time, and the probable expenditure of the ensuing month. The District Engineer will prepare an abstract of such lists as received from his subordinates, and send it with those original lists to the Inspecting Engineer; and the latter officer, unless he shall see special reasons to object, will authorize the District Engineer to draw for the amount, returning to him at the same time the original detailed lists, and retaining only the abstract. He will at the same time address a letter to the Collector acquainting him that he has given such authority to the District Engineer. The District Engineer will draw on the Tahsildars in favor of his Executive Agents as he finds occasion, in the course of the month. Appendices X to Z contain forms of the foregoing documents; viz. of the monthly estimates of the Executive Agents and the District Engineer respectively, and of the letter of credit from the Inspecting Engineer to the Collector.

The amount wanted in each Talook to be specified.

481. But it will be necessary that the Collector should be duly informed before the beginning of each month, not only what amount he will be called on to supply during the course of it, but also in what Talooks it will be required. To meet this want it will only be necessary that the letter of credit from the Inspecting Engineer to the Collector should show what proportion of the total sum will probably be required in each Talook; and that information also may be authentically supplied, in the original memo. received from the Executive Agents; as is shown in Appendix X, just referred to. With the aid of such a document the Collector will be able to provide the necessary funds wherever required; we will briefly show how this will be done.

The Collector will easily arrange for the provision of the funds wanted.

482. The object will be to have sufficient available cash in each Talook to meet the drafts of the District Engineers and not much more than enough. In order to effect this the Collector must have information both as to the probable requirements of the Engineer and the probable state of the Talook Treasuries. The notification just spoken of to be received from the Inspecting Engineer will supply the former; it will generally reach the Collector about the 25th or 26th of the month. On the 25th also every Tahsildar should send to the Collector a memo. showing the condition of his Treasury on that day, and the probable receipts by collections of Revenue and otherwise, as well as the probable outgoings, between that time and the 25th of the following month. With these two papers before him the Collector will be able to tell at a glance whether the cash in the Talook Treasury will be sufficient for the demands on it, or whether it will be necessary to place additional funds there. In the latter case it will be necessary either to send the required

amount direct from the Collector's Treasury, or to transfer it from that of a contiguous or more remote Talook, so as to save the carriage to the Collector's Treasury and back. If on the other hand the funds in the Tahsildar's Cash chest are likely to be more than sufficient, the Collector will send him orders how to dispose of the surplus; whether to send it to the Head Quarter's Treasury, or to some other Talook Treasury where it may be wanted.

Having a tabular statement of the condition of the several Talook Treasuries and the probable receipts and disbursements at each, which statement will be prepared from the materials above specified, a Collector will make all the required arrangements in half an hour. In general they will be very simple; for out of the whole twelve months, there are only three in which the collections will not generally very far exceed all the Talook expenditures of all kinds. In those three months some transfers from Talook to Talook will sometimes be required; in all the others, the surplus over and above the probable expenditure will be simply remitted to the Collector's Treasury.

483. We have mentioned delay as one of the reasons against requiring that the monthly estimate of disbursement should receive the sanction of a Presidency authority, and we may briefly explain how the delay would be caused. We propose that the estimates shall be made up for the 20th of each month, thus allowing time for them to go through all the stages of their progress, and reach the Collector in time for him to make the necessary arrangements. But if it were required that they should be sent to Madras for sanction, at least fifteen or twenty days must be allowed in addition; and instead of the 20th of the month preceding that to which it referred, the estimate must be made up to the 5th or even up to close of the previous month. In the Military Pay Department, every Paymaster sends monthly to the Military Auditor General an estimate of his requirements in the succeeding month; and these estimates are dispatched in some cases as early as the 8th or 9th. But though this may be productive of no inconvenience in the Pay Department, it would be otherwise in the case of the Public Works. With so long an interval the value of the estimate would be reduced almost to nothing. The disbursements of the Paymasters vary but little from month to month, except in cases of changes and transfers of troops which are usually known long before; they can therefore give that long previous notice of their wants without difficulty. But in the case of the Public Works expenditure, the amount from month to month varies considerably. In order to make an estimate of it for any month valuable as an approximation to the truth, it must be based on a state of things as near as possible in point of time to the period to which it refers. An estimate made a month beforehand could be but little more accurate than one made at the beginning of the year; so that in preference to that, it would be better to dispense with the monthly estimate altogether.

The monthly estimate should not go to the Presidency.

Thus the very delay appears a fully sufficient reason why the monthly estimates of expenditure should not be made to need Presidency sanction. We have also stated our reasons for believing that such a requirement is quite unnecessary. There is no such restriction on the local officers at present in either the Revenue or the Road Department; and we should hardly have thought it necessary to argue against the imposition of it, but that in the Military Department even much more rigid regulations are in force, and are strictly maintained.

484. Under the foregoing arrangements the necessary funds will be provided as required without impediment or inconvenience. The Accountant General will have previous information what amounts will be wanted during the year in each Collectorate; while the usual annual estimates by the Collectors and their half yearly estimates of assets in each month, will acquaint him what funds are likely to be available, and the Collector will be duly informed beforehand every month what sum will be required in each Talook of his district, and will so be enabled to make the necessary arrangements. We may here remark that the plan above set forth for providing funds in the Talooks involves an innovation on the practice now existing, under which all monies collected are remitted entire to the Collector's Treasury, and the various sums required for disbursement in the Talook are thence sent back again. The same end might indeed be effected, though clumsily, by the present practice, as the coin for all the Talook expenditures might still continue to be sent from the Collector's Treasury; but the other plan has so large and so obvious an advantage in respect to simplicity, safety, and economy of labour, that we earnestly advocate the change; we shall presently offer some more detailed observations upon it.

The foregoing arrangement will ensure its object.

The departmental function; the control of the advances, and their adjustment.

At present there is no control in the Revenue and the Road Departments.

And in the Military Department it is effected in a clumsy manner.

Advances how to be drawn by the District Engineer.

485. We now go on to speak of the mode in which the advances to the District Engineer will be controlled; will be drawn by them, and distributed to their subordinates; how they should be exhibited in their own and their subordinates' accounts; and how they should be adjusted, and the adjustment be controlled and ensured.

We have detailed the existing system as respects the advances of cash for work in each of the three branches of the Department, and have shown that of all the three a due control exists in the Military alone. In the Revenue and the Road Departments there is but a very imperfect control either over the issue of advances or towards bringing them to adjustment; neither the Board of Revenue the Head of the former Department, nor the Accountant General, is furnished with the necessary information to exercise such control in either case. In the Revenue Department the Collector who both issues the advances and himself receives and accounts for them, is so entirely uncontrolled that if he issues half a lack or a lack of rupees without authority, neither the Board of Revenue the Accountant General nor the Civil Auditor could detect it. In the Road Department the Accountant General possesses somewhat better means of controlling the advances, because the officer who issues them is distinct from the officer who receives them; but those means have never been much used.

486. And though, in the Military Department the required control is ensured, it is so in a clumsy and laborious manner; and we cannot propose that method for general adoption. Under that system every separate advance for each particular work, except petty repairs under 50 Rs. each, must be separately authorized, and drawn on a separate receipt; and, with the same exception, every work, and each advance for every work, must be kept distinct from all others, not only in the books of the Executive Officer where it is necessary and proper, but in those also of the Paymaster, and of the Accountant General's office. The several advances made for the work, and the exact payment which adjusts the difference between the aggregate of the advances and the actual cost, all these must be brought into the books of the Military Board and of the Accountant General; and the final adjustment can only be made by a special order from the Accountant General in each case, distinct from and in addition to that of Government or of the Military Board, sanctioning the bill.

This practice of thus keeping separate the advances for individual works, and of adjusting them separately in the Accountant General's Office, involves a vast deal of labour, and yet is quite superfluous. It is an awkward contrivance arising out of a jealousy of the Executive Officers, and from forgetfulness of the power of a good system of accounts to effect the same object with equal certainty by another and much more easy method. It is analogous to the practice in the Revenue Department just referred to, by which the coin for every separate payment requiring to be made from the Talook, is sent down from the Collector's Treasury, and is kept tied up separately till entirely disbursed, as though there could be no safety or security unless the very identical coin received for each separate item of expenditure were reserved to that alone. With similar disregard of the virtue of a good system of accounts, each separate advance for every work in the Military Department is authorized by a separate order, issued on a separate receipt, and adjusted on either side by a separate payment by or to the Engineer. This kind of minute care is not necessary, and is useless; it is in short wasted being directed to wrong points; it causes great labour and multiplicity of documents and correspondence, and would be absolutely impracticable in an extensive department.

487. We will now detail the system which we propose to substitute; and, first, as to the control of the issue of advances. Under the arrangements above set forth every District Engineer and other Executive Officer will receive every month from the Inspecting Engineer a credit on the Collector for a certain amount sufficient for the expenditure of the month. And before granting that credit the Inspecting Engineer, an officer unconnected with the Executive Department and under a direct responsibility, will scrutinize the details of the demand; and will ascertain that the amount is in due proportion to the works sanctioned and in course of execution, with reference both to the quantity of work actually done out of past advances, the balance of cash remaining, and the work to be done during the month in question. This will effectually prevent any excessive or unauthorized issue of cash, while the responsibility of thus preventing it will be laid on the officer who has of all persons the best means of exercising an intelligent judgment on the question, viz. on the local and immediate Professional Superior of the Executive Officer.

entive Officer. The letter from the Inspecting Engineer to the Collector notifying the amount which he has empowered the District Engineer to receive during the ensuing month, will be the Collector's immediate Warrant for the disbursements required in that month. The District Engineer will draw for the amount in such sums as may be convenient, and the total amount thus drawn in the month will be debited in the Collector's journal, and the drafts themselves, duly discharged, will accompany the journal as vouchers.

488. It may sometimes occur, though such instances will be rare, that sudden and unforeseen occasion for expenditure will arise in the course of the month, so as to make the amount of the credit insufficient. In such rare cases, a supplementary credit may be obtained from the Inspecting Engineer; or if it should be late in the month, and the amount required not very large, a power may be given to the District Engineer to draw on emergency; but such emergent advances should be immediately notified by the Collector to the Inspecting Engineer. Both these expedients exist in the instance of the Paymasters, but their exercise is rare, as it would be in that of the District Engineers.

The District Engineer will usually have charge of the execution of all works within the Collectorate to which he is attached, and he will distribute the funds to his Subordinates the immediate executives. In particular cases however, as we have before noticed, it will probably be found convenient to place a work of unusual magnitude under a separate control, distinct from that of the District Engineer, so as to avoid overloading him with too much work. In such cases the officer so vested with special charge should send in a separate estimate of his requirements to the Inspecting Engineer, and should draw money direct from the Collector and not through the District Engineer.

489. It is important to bear in mind the real nature of the credit given by the Inspecting Engineer, and the difference between it and the drafts drawn by the District Engineer in virtue of the authority so conveyed. The former is merely an authority to disburse money; it is the latter alone which has any immediate connection with the actual payment, or which can be a voucher for it. In the case of the Road Department this distinction has been overlooked. The "Receipt" given by the Superintendent of Roads, though called by that name, is in fact strictly analogous to the letter of credit issued monthly to the Military Paymaster, to the "assignments" in use in the Public Works Department in Bengal; and to the credits which we propose shall be given by the Inspecting Engineer. It is not in any way directly connected with the payment of cash, it is merely an authority to pay it. Yet by a mistake of the Account Department, this credit, or receipt as it is improperly called, is put in the place of an acknowledgment for cash actually received. It is this document, and not the drafts upon which the cash is really paid, that is sent up to the Accountant General as a voucher for the disbursement.

Nor is this all; this mistake has led to a still more serious departure from sound principles. In order to preserve agreement between the disbursement and the so called voucher, the whole amount of the Receipt is at once debited by the Collector, immediately that document reaches him; though it is not really disbursed for some time after, and then in several portions and on various dates. In this interval between the fictitious and the real disbursement, the amount remains in the Treasury under the head of "Deposits of the Revenue Department"; and in addition to the admitted evil of having such a deposit fund, it is necessary to keep a separate account of the receipts and issues of that fund. This complication and irregularity is caused by the neglect to observe the real nature of the "Receipt" of the Superintendent of Roads. We have thus dwelt upon that mistake and its consequences, because we are very anxious to guard against the entry of the same error into the new Department; as it would certainly be a source of confusion and embarrassment.*

490. The monthly credit to be given by the Inspecting Engineer will be the limit on the issues of cash by the Collector to the Executive Officer; but the drafts of the latter will be the vouchers for the disbursements. And the warrant or authority under which the Accountant General will admit those disbursements when appearing in the Collector's Journal, will be the budget

* In describing the advances in the Road Department, we spoke of the practice as in some degree various, both with regard to the time of debiting the amount of the "Receipts," and the disposal of those documents. After those Paragraphs were written, we received from the Acting Collector of North Arcot, a copy of a letter then just received from the Accountant General, prescribing the course detailed above, which may therefore be regarded as at present the practice of the Department.

Supplemental credits.

Officers in charge of special works.

The difference between a credit given, & an acknowledgment for cash received.

The monthly letter of credit how to be ultimately disposed of.

sanctioned by the Government, and the subsequent sanctioned estimates, and not the monthly credit given by the Inspecting Engineer, which merely intimates what amount out of that sanction will be expended in the month to which it refers. This being the character of this monthly credit, it is not a document which need go to the Accountant General; but it will still have several uses after, and in addition to, its immediate and primary use. It will be proper that the Inspecting Engineer should know from the Collector what amount has been actually drawn by the District Engineer. And in order to supply this we propose that after the close of the month the Collector shall note on the back of the letter of credit the amount actually paid out under it, and return it to the Inspecting Engineer. It does not appear to us necessary that all the several drafts of the District Engineer should be particularized; it will be sufficient to state the total amount drawn. The Inspecting Engineer having made a note in his office of the amount drawn, will then forward the document to the Board of Public Works to whom it will serve a double purpose. It will enable them to ensure that the rules for the issue of cash under these monthly credits are duly observed; but its main use will be to afford the most authentic means, viz. intelligence from the disbursing officer himself, of verifying the amount set down as received during the month, in the monthly account current of the District Engineer of which we shall speak presently.

Only the total amount of the monthly credit should be strictly construed.

491. It is our intention that the monthly credit, which it must be remembered is founded on estimate merely, should be construed strictly, only as to its total amount. That should be the limit to the Collector's issues, except in the extraordinary cases above stated in para 488, but as to the distribution of the amount, that should be left very much to the District Engineer. The actual outlay in the month on any one work may be more or less than was set down in the previous list; and works not in the list at all may share in the amount when necessary. So also as to the places where the money is drawn; the particular sums in each Talook will be specified as nearly as can be done; but the District Engineer will not be strictly tied to that arrangement. Only, when he requires a larger sum in any Talook than he had anticipated, compliance with the requisition must be contingent on the actual state of the Talook Treasury.

It will be current for one month only.

We have only to add on the subject of this monthly credit, that we propose that it shall be current only for the single month to which it refers, and shall cease to have validity immediately on its close; so that drafts drawn under it shall not be cashed unless presented within the month. This rule appears highly advisable for the sake of preserving simplicity and order in the accounts, and we are of opinion that it will not produce any inconvenience to the Executive Department, because, under the arrangement which we shall detail presently, the District Engineer will be made acquainted on the 21st or 22d of each month with the whole of the wants of his Subordinates for that month, and so ample time will be allowed for supplying them with drafts and for drawing the cash.

Certain Registers to be kept by the Inspecting Engineer.

492. To enable the Inspecting Engineer duly to control the operations of the Executive Department, and in particular the advances of Cash, it will be necessary that he should keep certain registers both of the works authorized and of the amounts actually drawn for their execution. Three forms for Registers adapted to effect this object will be found in Appendices I I to K K, to be kept by the Inspecting Engineer for each District of his Division. The first of these is a general Register of Estimates, in which will be entered consecutively all the estimates which reach the Inspecting Engineer; the columns designed to show the subsequent progress of the estimates and the works to which they refer, being filled up from time to time as the several events occur.

From this Register the entries of amounts sanctioned by Government, or authorized or appropriated by the Collector and the Inspecting Engineer, out of the sums placed at their disposal for particular classes of works, will be posted immediately in the next Register Appendix J J, which shows such passed estimates arranged in the same classes as are exhibited in the annual budget. This document will keep the Inspecting Engineer always informed as to the amount of expenditure sanctioned under each of those divisions; and will enable him duly to regulate his monthly credits to the District Engineers.

The third Register, Appendix K K, will show the actual disbursement in each month on works of each of the same classes. The information to be embodied in this statement will be furnished with complete accuracy and perfect ease by the District Engineer. To explain how this will be done, we must anticipate a little, and refer to the statement which will accompany the monthly Account Current to be rendered by the Executive Agents, a form and model of which

will be found in Appendix D D 2. That Statement will show for the District Engineer's information the exact distribution of the cash disbursed by the agent on works in progress, specifying each by name; the amount disbursed on each in former months, and in the month under report, will be shown separately. In order to keep the Inspecting Engineer informed as to the actual state of the expenditure on each class of works, it will only be necessary that the District Engineer should furnish him with an abstract of these details of the monthly disbursements, showing the amount for works of each class. That information will be at once posted into the Inspecting Engineer's Register of monthly expenditure. This will keep that officer exactly acquainted with the expenditure on the several classes of works, and enable him to avoid exceeding the sanction in any one. The Inspecting Engineer should put together this information for all the Districts of his Division, and send it in a small monthly statement to the Board of Public Works; to whom it will afford valuable information and means of check, in a compendious shape.

493. It will be remembered that we have proposed that a certain sum should be fixed for each District, for the repair and maintenance of the Irrigation works; also that annual allowances should be granted for the maintenance of all roads when once made; and that in each District a certain sum should be placed yearly at the disposal of the Collector for the repair and improvement of the unmade or District roads. We have also recommended that the annual budget shall include a certain sum computed on averages, for the repair of buildings; and others for the purchase of tools and for ordinary contingent expenses. We are of opinion that the allotments for the first mentioned three objects should be interpreted strictly, and that it should not be permitted to the local officers to exceed the grants in any case, except only on particular emergency in the case of Irrigation works, which emergency should immediately be reported. As respects the remaining three, we are of opinion that more latitude should be permitted. In speaking of the estimates, we have already (para 36) given our reasons for thinking that no annual money limit should be fixed for the outlay in the repair of buildings; viz. that past experience shows that naturally those repairs differ very considerably in amount from year to year, and that the whole amount cannot be much in any year. It follows that the sum included in the yearly budget on this amount should be regarded simply as an estimate for the use of the Finance Department, and that the local officers should be free to authorize and execute in each year whatever repairs are found to be necessary in that year. Under the strict rules which we have proposed for repairs, excluding all improvements and alterations, the expenditure on repairs will never be large. So also as to the purchase of tools, and ordinary contingent charges; we propose that the annual budget shall contain a sum on each of these accounts equal to the average yearly expenditure of the last three years, but this only for the purposes of the Finance Department and not as a limit on the operations of the Executive Officers. The requirements of one year will vary from those of another; and it is for the interest of the Government that the purchases should vary also.

The nature of certain of the items comprised in the budget.

494. The whole of the allowances and grants above spoken of, viz. for the maintenance of Irrigation works, for the maintenance of made roads, for the repair and improvement of the country roads, for the repair of buildings, for tools, and for contingencies, should be strictly limited to the year for which they are made. Whatever part of any one of the number may remain unappropriated or unexpended at the close of the year, should revert to the Treasury; even in cases where work is actually in progress under appropriation from any one of these grants, only so much of the expenditure as is actually incurred up to 30th April inclusive, shall be charged to the allowance of the expiring year; the remainder shall be charged to that of the new year. Under the system of accounts which we have detailed this division will be perfectly simple and easy. Both the cash books of the Executive Agent, and the station books of the work, show the actual expenditure upon it for every day; and the statement compiled from the Cash book, proposed as above to be sent every month to the District Engineer by each Executive Agent, will show the precise expenditure during the month on each work under his charge. For the purpose to which we are now alluding it will only be necessary that for the month of April the full detail of those statements as received by the District Engineer shall be sent to the Inspecting Engineer, instead of merely the abstract which will be sufficient in the other months. The Inspecting Engineer having that information will be able at once to deduct the amount already expended on each particular unfinished work, and to bring forward the remainder in his Register for the opening year. The Cash books and Station books will also afford the means of making out a separate bill with perfect ease, for the expenditure incurred prior to the close of the year.

The yearly allowances for Public works to be strictly limited to the year.

Appropriations for special works to be similarly limited.

The system proposed will not be derogatory to the Collector.

The various functions united in the Collector.

Examples of the proposed arrangement already existing.

The distribution of funds to the executive Agents.

We may add that the same rule will apply to sums specially granted by Government for particular works. In the case of works of magnitude, so much of the sanctioned amount as will probably be expended within the year will be included in the budget: any portion of that sum unexpended at the close of the year will revert to the Treasury, and the further expenditure will be out of the sum allowed in the budget of the succeeding year. In the case of smaller works, too, incomplete at the close of the official year, the same rule will be adhered to. This is absolutely necessary, as will be shown hereafter, to clearness and exactness in the accounts.

495. It may be proper to offer a few remarks here on the plan above proposed for the regulation of the advances for Public Works. In this Presidency, where hitherto the whole distribution of the funds for the execution of work has been in the hands of the Collector, the proposal to vest in the Inspecting Engineer the power to limit and control the issue of the advances, and to give credits on the Collector, may perhaps be unfavourably received at first sight, as an uncalled for innovation, as a serious invasion of the authority of the last mentioned officer, and as placing the Inspecting Engineer in a position of superiority over him. But we are persuaded that a little consideration will dissipate this objection. The regulation of the advances of cash belongs properly and necessarily to the officer who is charged with the control of the Executive; and if, as we trust, we have adduced good reasons for relieving the Collector from that charge, the control of the advances must go with it. The change therefore is not without cause. Nor can it be truly regarded as in any way placing the Inspecting Engineer above the Collector. The Engineer will not sanction the disbursement of money; that will still continue to be sanctioned by the Government; but the Inspecting Engineer as the local controller of the Executive, will determine what portion of the sanctioned expenditure will properly be expended in each month, and in some minor cases will decide on the particular distribution of funds allotted to certain objects by the Government.

496. We must observe too that it is only the anomalous union of various functions in the same person, which causes even the appearance of any thing derogatory in the proposed arrangement. The office of Treasurer and Paymaster is not properly or necessarily associated with that of controller of the Revenue and general representative of the Executive Power in a large Province; it is in the latter character that the Collector is an officer of high importance and consideration; but it is only in the former that he is at all brought into communication with the Engineer Department in the disbursement of money.

It may be added that examples of the arrangement which we propose can be pointed to as already existing; and we are not aware that any of the supposed inconvenience results. In our own Presidency, the Superintendent of Roads does now actually give credits on the Collectors, and money is disbursed by those officers accordingly, without any control whatever over the amount; our proposed system simply extends this arrangement in its essential parts, to the whole of the Public Works Department, but with the addition of independent means afforded to the Collector of checking the amount drawn by the Engineers. Again we may cite the practice in the North West Provinces, and we believe also in Bengal proper. The Superintending Engineer, who on the Bengal Establishment is really superintending and not merely Executive as at Madras, and who is thus in a position precisely analogous to that which will be held by the Inspecting Engineers in our scheme, gives to the Executive Engineers "assignments," as they are called, on the Collectors; which are in fact credits, and exactly resemble in effect and operation the letters of credit proposed to be given by our Inspecting Engineers.

497. We now go on to speak of the distribution of the funds for actual disbursement. Due notice will be given to the Collector every month, as above provided, what proportion of the whole month's credit will probably be required in each Talook of his District, and he will then direct his several Tahsildars to cash the District Engineer's drafts presented within the month, as far as those amounts respectively. The District Engineer will not require to draw any part of the money himself, except small sums for office contingencies. Like the Assistant Superintendents in the Road Department, he will not himself disburse any money for work, but will advance it to his subordinates the immediate Executive Agents; and he will distribute the necessary funds to those Agents by means of drafts drawn on the several Tahsildars. The Tahsildars will cash these drafts, and debit the amount in their account, sending the discharged drafts to the Collector with their

accounts at the end of the month; and the whole amount so drawn in all the Talooks will be debited in the Collector's journal for the month, and the drafts will be sent with it to the Accountant General as above described.

498. In order to make the District Engineer duly acquainted with the wants of his Subordinates in this respect, and to enable him to supply them, it is necessary that he should receive periodical information, as in the Road Department, of their expenditure and requirements. To meet this want, we propose that every Executive Agent should send to the District Engineer three times a month, viz. on the 1st, the 11th, and the 21st, a short statement, shewing his expenditure during the previous ten days, the balance in hand, and his requirements for the next ten days. It is not necessary that this should be in detail, because the monthly estimate informs the District Engineer as to the works in progress, and added to his general knowledge will be fully sufficient to enable him to check those statements. A form for this ten days report will be found in Appendix A. A. Having received the paper, and approved it, the District Engineer will send drafts to his several Subordinates for the amounts wanted. To simplify the accounts, we propose, as already said, that both the monthly credit given by the Inspecting Engineer, and the drafts drawn under that authority, shall be current only during the month specified; this will cause no inconvenience, because the ten days report of the 21st will allow ample time for the required funds to be drawn before the end of the month.

The District Engineer will keep a Register of his drafts, in which they should be entered with consecutive numbers attached, as soon as drawn. Appendix B. B is a form proposed for that Register. The Collector also should keep a similar Register of drafts cashed. At the close of the month the Collector will note the amount of the drafts cashed on the back of the letter of credit received from the Inspecting Engineer, and return it to that officer, to be by him forwarded to the Board of Public Works as above noticed. The District Engineer will enter the amounts of his drafts on the debit side of the Account Current, which as we shall presently notice he will send monthly to the Board of Public Works.

499. According to the executive arrangements proposed above in Section III (Para 240) each Overseer or other immediate Executive Agent will generally have charge of the whole of the works of all kinds within a certain circle. Where these works are of the merely ordinary kind they may often be very numerous, though each of no great amount; an Overseer may often have twenty or thirty works under execution at once, but it will not be necessary that cash should be advanced to him separately for each work. Such a system causes great complexity in the accounts, and affords no guarantee against misappropriation, which may not be repaired with equal certainty by simple means. It also makes it necessary that the executive officer should have in hand a larger amount of cash than would otherwise be necessary, because he must have for each and every work separately, enough to ensure that he will not be brought to a stand for want of funds. This as we have already mentioned is the practice in the Military Department; we have seen how detailed and complicated the accounts of advances are in that Department, and if the officers avoid holding large sums, it is only by the universal evasion of the rule which prescribes that an advance for one work shall not be devoted to another. Practically that rule is entirely disregarded; an Executive Engineer receiving orders for advances of cash for perhaps twenty different works, does not get them all cashed, though he immediately commences all the works. He cashes the orders to a sufficient amount to give him money enough for immediate operations on all the works in hand; and when that is expended he cashes other orders with the same view, expending the proceeds on all the works generally, without the slightest regard to the appropriation of each to the particular work designated in it. In short he regards his orders for advances simply as if they were general drafts for cash; and the working of the system in this respect under this evasive practice, is in fact exactly that which we propose to establish, viz. to supply the Executive Agents with cash by drafts in sums sufficient for their immediate wants.

500. We propose then that the executives under the new system, like the Overseers in the Road Department should receive advances in the general, to be actually disbursed by them on whatever works in progress may require it. Their books will be kept in the mode above described in the last part of Section II, and of which specimens are given in Appendix II, subject to

Statements of cash required to be sent in by them every ten days.

Registers of the drafts to be kept by the District Engineer; and by the Collectors.

The advances should not be specific for particular works.

But general to be employed as required on the works in progress.

some modifications to suit the different nature of the works on which they will be engaged. They will never need to have large sums in their possession, but will probably draw money about once or twice every ten days for the actual disbursements of the same period. In the Road Department we pointed out that the Overseers sometimes allow far too long a time to pass without paying the work people, and thus they have larger amounts in their cash chests and for longer periods than would otherwise be the case; more frequent payments should on every account be enforced. The abstract or summary of the Executive's cash book sent to the District Engineer punctually at the close of each month, will keep that officer fully informed of the state of his cash chest, and of his payments, and will afford a complete and effective check over the advances he receives, and over his disposal of them. The frequent personal inspection by the District Engineer, of the works done will also be a valuable check; and that our system fully provides. But we trust even more to the prompt and speedy execution of work, and closing and auditing of accounts, which will take place under it. The amounts in the hands of the Executive Agents will always be small, and even those will only remain there a few days; and their actual disbursements in each month will be compared with the sums advanced to them in it, immediately at the close of the month.

The real nature of the advances under the new executive system.

501. And we may notice here that though called by the same name there will be a material difference between the advances under the new system and under the present, especially in the Revenue Department. Of the amount styled advances at present in that Department a large part is always lying idle either in a Talook Treasury, or in the hands of Monigars, contractors for the supply of materials, or others, no equivalent having yet been rendered. Under the new system advances in this sense will almost cease; and with the exception of the small sums actually in the hands of the executives for immediate use, the advances will be composed almost wholly of sums paid away for work actually done. This will at once be seen, on recurring to what is said of the Station books in Section II, and the proposed executive system in the latter part of Section III; and considering that in connection with our plan for issuing cash on the ten days reports or indents. It will then be clear that a service will almost invariably be performed before it is paid for; and that the amounts in the hands of the executive Department will always be very small, and be retained for only a few days. Indeed it may be said almost strictly that money will be drawn by the Executive Department only after the service for which it is to be disbursed has been actually performed; and that it will be called an advance only because it cannot be entered as a disbursement till the accounts have been made up.

Greatly increased check over the commissioned Executive Officers.

502. This new condition of the advances, especially combined with the clear and simple accounts to be rendered at short periods, will very much diminish the pecuniary responsibility of Executive Engineers. Not only will the advances in the hands of the Executive Department be very much diminished; but clear and brief accounts will be rendered every month, and the falsification of them could only take place by a deliberate combination in fraud between the Commissioned Officer and his Subordinate Executive Agent, a combination which may be pronounced impossible. We would point to this change in connection with what we have already said on the subject of the exaction of money security from those Officers, as a further reason for abandoning that practice.

As well as over the Subordinate Agents.

As respects the class of European Subordinates too, these circumstances deserve special remark. There is in some quarters a feeling adverse to confiding to that class the expenditure of money; and persons who see no objection to entrusting this function, as well as various others connected with the settlement and collection of Revenue to the amount of a lac and a half or two lacs of Rupees a year, to a Native Tahsildar or 50 or 100 Rupees a month, consider it dangerous to entrust the same duty to a European Overseer. We allude to that distrust here, only to point out how the arrangements which we have detailed will remove any possible grounds for it at present existing. A Tahsildar while vested with large and various trusts, possesses such a concentration of powers as enables him to suppress or triumph over all complaints; under the present system, too, he holds large advances for public works, and renders no intelligible or trustworthy accounts of his disbursements. Our proposed system will make one step to break up this monopoly of influence. Thus the Executive Agent will be under a general guarantee for good conduct which cannot possibly exist under present circumstances; while he will hold extremely small sums of money in his hands, and will render frequent and simple accounts. Can there be any doubt which of the two systems holds out the best security for right conduct?

503. Every Executive Agent will send in an Account Current at the end of each month to the District Engineer; and every District Engineer will send an Account Current monthly to the Board of Public Works. Forms of both these accounts are given in Appendices D D and F F that of the Executive Agent will show on one side the balance against him at the beginning of the month, and the advances of cash which he has received in the course of it; on the other side it will detail the bills for work performed made out and transmitted to the District Engineer during the month, and the balance remaining; whether in the form of cash in hand, or of disbursements on works in progress. The details of the last item will be set forth in a statement which should accompany the Account Current. That statement, of which a form is given in Appendix D D 2 will give individually the names of all the works in course of execution during the month, and the disbursement on account of each one, both prior to that month and in the course of it. This paper will give the District Engineer complete and exact insight into the operations of his subordinate Executive Agents, and will enable him, as just mentioned, to bring their disbursements into close and strict comparison with the advances they shall have received. The Account Current and the Statement will both be prepared by the Executive without any difficulty from his cash book and the abstract or abstracts of it; and they may be dispatched by him on the 1st day of the month following that to which they refer.

The Executive Agents will send monthly Accounts Current to the District Engineer.

504. Appendix F F is the form for the District Engineer's Account Current. It will show on one side the balance of advances against the Engineer at the commencement of the month, and the sums drawn for during the month, which latter will be simply a transcript of his Register of drafts already spoken of; on the other side will be exhibited all the bills sent during the month to the Inspecting Engineer for submission to the Board, and the balance remaining. The particulars of this balance will also be shown; viz. how much is in cash in the hands of the District Engineer himself, which will always be very trifling, being only small sums for contingencies; how much in the hands of the Executive Agents in cash, which also will be small in amount; how much disbursed by those officers on works in progress, and for which bills have not yet been received; and how much in bills for work done received from them and under examination by the District Engineer. The principal use of this Account Current will be to supply the Board of Public Works with the information required for compiling their journal, of which we shall speak at length in the next Section; but in addition to that, it will also be useful in laying open to the scrutiny of the Board, the proceedings of the District Engineer as well as of his Subordinates. As to the latter, it will show the Board what amount of cash remains in their hands, out of the advances for works, and what degree of expedition is used in preparing bills for work done; as to the District Engineers, it will enable the Board to judge of their activity in examining and forwarding bills received from their subordinates. The debit side of the District Engineer's Account Current will be taken, as already said, from his Register of drafts; the credit side will be compiled chiefly from his office Register of works in progress, of which we shall speak presently, checked by comparison with the Accounts Current of his Subordinates; and partly, viz. as respects the particulars of the balance against the latter Officers, from those Accounts Current. It will be made out with very little trouble, and the greater part of it may be ready before the receipt of the Subordinate Accounts. It ought therefore to be dispatched to the Board without fail within one day after their receipt, viz. on the 4th or 5th of the month.

And the District Engineers will render Accounts Current to the Board of Public Works.

505. We have said that the Account Current should come to the Board of Public Works and not to the Accountant General; and we say this because it appears to us, as already stated, that the duty of watching, checking and controlling the advances for Public Works, and securing their being duly brought to adjustment, devolves upon the Board, as regards all the details, properly and almost of necessity if it is to be done efficiently, as the controlling head of the Department. But this control of the details will not prevent or interfere with that general control which the Accountant General ought to exercise over this and every other matter connected with the accounts. It will be his part to take care that the aggregate sums allowed by Government are not exceeded, and that no long outstanding advances are allowed in any District. This distinction indeed is not duly observed at present, and in the Military Department the control and adjustment of the advances are now performed by the Accountant General in the most minute detail; but this is not a proper distribution of duties, but a thrusting on the Accountant General of functions which do not belong to him. The work is now done in the Transfer Department of his office, but we

The control of the advances should be in the Board of Works.

certainly think that it would more properly be done in the office of the Military Board; who in this department also would merely communicate the results and submit their books to the Accountant General, as they do already in the Ordnance branch of their business. In the Revenue Department it cannot be said that any effective control whatever is at present exercised over the advances and adjustments.

The abstracts of the cash book for particular works.

506. We may here notice that a slight change will be required in the mode of keeping the books for the general work of a District, from that proposed above in the Section II for those for simple Road work. In the cash book the whole of the disbursements on all the works will be entered indiscriminately in the order in which they occur; but there should be an abstract of the expenditure on each work, in which the whole charges for that work will be brought together. For Road expenditure, we have proposed that the abstracts for the several works shall be in a single statement or table, because those accounts will all come under review together. But where there are a number of distinct and independent works in progress at once, as will usually be the case with the District Executive, the preferable plan will be to have the abstracts on separate leaves of a book loosely stitched together. Then when each work is done, or the period is arrived for sending in a bill, that leaf may be detached and with the station book, be sent up to the District Engineer together with the bill. The cash book may remain permanently with the Executive till it is filled, when it may be deposited in the Office of the District Engineer. At all times also the cash book of every executive will be open to the inspection of the District Engineer; and it will be his duty, as above provided, to ascertain from time to time that both it and the abstracts of it are properly kept.

An office Register to be kept by the Executive Agents.

507. It remains to notice a few forms given in the Appendix, and not yet described. Appendices G G and H H are office Registers to be kept respectively by the Executive Agents and the District Engineers. The former of them needs but little remark; it records the progress of each work from the time when the estimate is received for execution, to the despatch of the bill to the District Engineer; which event discharges the Agent from so much of the balance against him, subject only to any error in the bill or fault or fraud in the work. This Register will not only be useful in keeping the Agent acquainted with the state of works in progress under his charge, but will also form a permanent record of works performed. Immediately on an estimate being received for execution the particulars up to that point will be entered in the Register; and the remaining columns will be filled up from time to time as the events successively occur. Where any columns remain blank at the conclusion of the official year the work will be carried forward into the next year's Register in the mode shown in the form.

And another by the District Engineer.

508. Appendix H H is the Register to be kept in the office of the District Engineer. It commences with the preparation of the estimate and notes every event down to the final closing of the account of the work. The estimate will be entered in the Register as soon as it is despatched to the Inspecting Engineer, and numbered in order commencing from the beginning of the year. The remaining columns will be filled up from time to time as the events to be recorded occur. Works incomplete at the end of the official year will be carried into the next year's Register. Besides its value as a permanent record of the operations of the office and of the work done, this Register will serve a variety of other useful purposes. It will show the District Engineer at any time what estimates have been sent up for sanction and are not yet returned; and from it he will be able to learn almost at a glance what works have been allotted for execution to each Executive Agent, what bills are due from them, and what bills have been received and are under examination. Another use of this Register will be to supply materials for making up the monthly Account Current. The bills sent to the Inspecting Engineer will be taken from the 15th Column of this Register; and the bills received and under examination will be obtained from the 12th column. The remaining particulars in the Account Current, viz. the cash in hand, and the amount expended on works in progress, will be obtained from the Cash book of the District Engineer and from the Accounts Current of his subordinates.

Progress Reports of works in execution.

509. Progress reports should be made monthly to the District Engineer of all works in course of execution. As respects all works under charge of Foremen, it appears advisable that these reports should originate with that class, who will be either immediately engaged upon them, or in the habit of frequently seeing them. There will probably be some works of the ordinary repair of tanks or channels in earth or rough stone, which being done by contract will not need the attention of a Foreman, but will be under a Conacappilly; with the periodical direction of the Execu-

tive Agent when he comes to measure the work done and pay for it. The Progress Report of such works will be prepared by the Executive Agent himself. Appendix C C is a form of the Report to be made by a Foreman. It appears to us that these reports ought to deal principally with the progress of the work itself, and to contain but little reference to its pecuniary relations, which will be duly recorded in other accounts and reports. Of money matters therefore the form gives only the amount of the estimate, and the amount expended, which will readily be found in the station books. The principal information contained in it is a brief statement of the progress actually made, which should be given with as much accuracy as is consistent with brevity. These reports should be sent through the Executive Agent to the District Engineer. It will probably be found expedient that all works should be individually specified for the information of the last mentioned officer; but it certainly is not necessary that this detail should go farther. To send such minute reports to the Board of Public Works would answer no good purpose whatever, for it would be quite impossible for the Board to deal with them. Again to send up a mere abstract without the names of the individual works would be equally useless, because such general reports would tell nothing; those now received by the Board of Revenue are of this nature, and they are quite useless. Neither is it necessary that the Board should thus trouble themselves about small works; the District Engineer will be an officer competent to his duty and under a clear responsibility for the due discharge of it, and these minor matters may safely be left to him, and ought to be so. As respects larger works, it may be proper that the Board should exercise some direct supervision: and this they can do by having reports on them only. We propose then that all works on estimate exceeding 2,000 Rupees should be thus specially reported; the particulars of such works should be extracted in the office of the District Engineer from the reports received from his subordinates; and being verified by his own knowledge, should be made into a statement in the same form, to be submitted through the Inspecting Engineer to the Board of Public Works.

The only form remaining to be noticed is that for the District Engineer's monthly statement of actual disbursements to be sent to the Inspecting Engineer as provided above in Para 492. That form will be found in Appendix E. E.

510. In the foregoing sketch of our proposed system of accounts and administration, we have spoken of it in regard to its operation in the general works of the department in our own Provinces, preferring for the sake of clearness to reserve for separate notice the mode of its application to works of other kinds. This we can do in a very few words. The other cases are the purely Military works, both within our own Provinces and in the Military Divisions beyond; and the Civil works and Roads in the Mysore country and in the Saugor Territories.

As regards the latter the system above described will apply in all particulars; the sole difference being that the denominations of some of the officers concerned will be changed. Thus in place of Collectors the Revenue administration in Mysore is vested in Superintendents of Division, and in Saugor, in Deputy Commissioners. Those Officers then will perform respectively all the functions assigned in our scheme to the Collectors as regards our own Provinces. They will receive instructions from the Accountant General at the commencement of the year of the amount of the Public Works budget for their respective Divisions; the Inspecting Engineer will give monthly credits on them in favor of the District or Executive Engineers as the case may be; and they will cash the drafts drawn by those officers in accordance with such credits, in the mode above specified in the case of Collectors.

Again as respects the Engineer Department. In Mysore we propose to retain the designation of District Engineer, assigning one such officer to each of the four Civil or Revenue "Divisions" into which that country is partitioned. In Saugor the Executive Engineers occupy the place of the District Engineers, and will perform all the duties assigned in our scheme to the officers of that class. They will send in annual and monthly estimates of the funds required, and will draw cash from the local Treasuries, and render accounts of their disbursements and proceedings to the Board of Public Works, as above described of the District Engineers in our own Territories.

511. As regards the Military works, both in the Stations within our possessions, in the purely Military Stations of Hyderabad, Nagpore, Jaulnah, &c., and in the Territories of Mysore and Saugor, some little modification will be necessary, in order to suit the subordination and discipline of Military bodies, which require that in Military Stations the authority to the Paymaster to disburse money for Public Works shall go through the Commanding Officer.

The operation of the proposed system, as regards the Civil works in the Mysore and Saugor Divisions.

Its operation as regards Military work in all the Divisions.

The execution of all works Civil or Military in a given locality will be in the same hands. Thus at Bangalore, Cannanore and the other stations, where we propose to have an Executive Engineer, chiefly on account of the numerous and extensive Military Buildings, Civil works in the place will also be executed by them. At smaller Military Stations there will be only a Subordinate of the Public Works Department; and he also will be under the control of the District Engineer, and his services will be available so far as may be deemed expedient, for Civil works as well as Military.

All Military work of whatever nature will be included by the District Engineer in his annual estimate like other works; and it will also be similarly included in his monthly estimates of cash required. In the case of work to be done at those stations where there is a Military Paymaster, the District Engineer will specify in his monthly cash estimate, what portion of the whole amount he requires to draw from the Paymaster, in like manner as he specifies the amount required in each Talook. The Inspecting Engineer then, besides his letter of credit addressed to the Collector, or other Civil administrator, will also address the Commanding Officer of the Division or Station notifying that he has authorized the District Engineer to draw that amount from the Paymaster and requesting him to empower the latter officer to issue it. The Commanding Officer will countersign that letter and send it to the Paymaster, who being thus authorized will disburse the amount on the drafts of the District Engineer. Whatever amount is thus procured from the Collector will be debited by that officer to the Military Books, and that head will be closed as at present to "General Books." At the end of the month the Paymaster will note on the back of the letter of credit the payments made, and will return it to the Inspecting Engineer; he will send the drafts of the District Engineer to the Accountant General with his Journal, as vouchers for the debits. The disbursements will be charged in his Journal in the mode, to be specified in the next Section. The District Engineer should acquaint the Paymaster beforehand every month with the probable amount of his requirements in the following month, in order that he may make provision for such demands in his monthly Estimate. And inasmuch as the annual budget is to be the limit of the total issues to the Department, the Collector must be kept duly informed what sums are drawn through the Military Paymaster. For Military works at Stations where there is no Military Paymaster or cash chest, the money will be drawn by the District Engineers from the Tahsildars, in the same manner as for other works.

Concluding
marks.

512. We now close our detail of the system which we propose as to the issue of cash, the checks over such advances, and their adjustment. That system provides for giving the Government a complete view beforehand of the expenditure of each year, by means of a detailed budget; which besides this use, will afterwards be the subject of comparison with the actual expenditure. Both these things, the previous estimate and the subsequent comparison have hitherto been wholly wanting. In fact up to the present time no accurate collective statement has ever been drawn up of the actual operations of any one year; nor, under the present system of accounts would it be possible to prepare such a statement. We shall recur to this in our next Section.

As respects the actual performance of work, it has been our endeavour to combine much freedom to the Executive Officers in obtaining advances of cash, with a real control over the amount to be issued to them; and considerable latitude in the application of the advances, with a strict and immediate responsibility for all the details of that application. The check in the former of these cases is attained by subjecting the Executive Engineer's monthly Cash Estimate to the approval of the Inspecting Engineer; and in the latter by the monthly return of the actual distribution of the cash. We have placed the supervision of the local officers in respect to the issue and the application of the advances, as well as to the actual performance of work, in the hands of the central and controlling head of the Department; that being decidedly in our opinion the proper distribution of duties. As respects the accounts, returns, and statements, by which the necessary facts are communicated and the necessary control exercised, our endeavour has been to unite simplicity and brevity with fullness of information. Independently of the advantages of these qualities for their own sake, their aid is essential to that punctuality in the rendering of accounts and statements on which the value of such documents so much depends. In the succeeding Section we shall detail the mode which we propose for recording the charges for works by the Board, and for subjecting their proceedings to supervision and scrutiny.

Reasons for giving
forms for ac-
counts.

513. In closing our remarks on these forms, it may be proper, in order to prevent misapprehension, to explain our reasons for giving these and the other forms which appear in the Appendix.

We beg to say then of the forms generally, as we have already said of those for estimates, that we do not propound them as being the best that can be devised, nor is it at all our object that they should be adopted and maintained unchangeably. We have carefully considered them indeed, and we are certain that they are improvements on existing forms, but we are well aware, that when brought into actual use defects may probably become apparent, and various ways of amending them may be perceived.

As respects those on which we have just been remarking, our chief reason for giving forms at all is this; we have seen reason to propose various material changes in the conduct of business, which will render necessary very considerable modifications in the existing system of accounts. If we had contented ourselves with making those general suggestions, we should have exposed ourselves to the imputation of making vague and ill considered proposals of great changes; and we should have left room for indolence and indifference to reject our recommendations as impracticable. But when we point out in detail how our plans can be carried into effect, we both deprive the indifferent of that plea, and remove difficulties from the way of those who really desire to see improvements introduced. This then is our reason for giving these forms; to point out one way by which our general proposals can be worked out in detail, without by any means presuming to say that this is in every particular the best way.

514. We will only add a few remarks on the subject of the payment of salaries and allowances in the department. We are of opinion that the Board of Public Works ought to have no concern at all with those payments, with the auditing of them, or with the recovery of retrenchments made in the audit. Those duties belong to the audit office, as respects this department as well as all other departments, and would only encumber the Board and occupy it with work foreign to its proper functions. And in order that the Board may be kept quite clear of these operations, as well as on other considerations, it will be necessary that the salaries and allowances should be paid to the department separately and distinctly from the advances for work, and this will be easily and simply effected by the following arrangements. The salaries &c. of the Board of Works and of all officers and establishments belonging to the department at the Presidency, shall be paid by the Sub-Treasurer or by the Military Paymaster, as may be determined, like other Establishments at the Presidency. In the Provinces the salaries and allowances of the department shall be paid by the Collector; and in the Military Divisions beyond the Frontier, by the Military Paymaster of the Division.

Salaries and allow-
ances.

515. At the Presidency, as well as in the Military Divisions beyond the Frontier, precisely the present mode of drawing salaries will be adhered to; in the Provinces the following method will be found simple and convenient. The Inspecting Engineer shall send in to the Collector every month an abstract of the salaries and allowances of himself and his establishment; and the District Engineer, and every special officer in charge of a work independently of the District Engineer, shall send in one for those of himself and his establishment. Every Sub-Engineer and Overseer in separate charge of a Division or a work shall prepare an abstract for himself and the servants under him, and shall send it to the District Engineer; or if they are employed under a separate officer, then to such officer. The District Engineer or special officer, as the case may be, shall countersign the abstracts of his subordinates, and send them to the Collector.

How and by what
officers to be
paid.

It shall be notified to the Collector by the officer transmitting an Abstract, where the amount is to be paid, viz. at the Collector's Treasury or in what particular Talook, and whether any and what portion in bills of exchange. The Collector having received the abstract will endorse it for payment to the Cash keeper, or to the Tahsildar of the Talook where it is to be paid, and then return it direct to the party who is to draw the money. No other order for payment will be necessary; the indorsement to the paying officer will be sufficient. Thus much tedious and useless correspondence will be avoided. The abstracts when presented to the officer to whom directed will be duly paid; and if at a Talook Treasury, the abstracts themselves will be sent to the Collector with the Account Current for the month. And those abstracts, as well as those cashed at the Collector's own Treasury, will be sent in due course to the proper Audit office at the Presidency, together with an "abstract of disbursements," or list.

516. It matters little whether the duty of auditing these charges be assigned to the Civil Auditor or to the Military Auditor General. If it be to the latter, the advantage will be gained that the

How to be audited.

whole pay and allowances of the Department will be audited in one office. But the duties of these officers being more civil than military, the task will probably be allotted to the Civil Audit office. However that point may be determined, we would earnestly advise that the audit wherever made should be monthly, according to the system at present followed in the Military Department. Having gone carefully into the system in both offices, we know that that is simple, easy, rapid, and efficacious; while the method in the Civil Audit office is complicated, and dilatory, and after all gives no real audit.

How to be debited
and classified.

In order to keep the charge of the Establishments in this Department distinct from other charges, it is desirable that they should be debited to a distinct head. We propose that the officer disbursing the Salaries should debit the amount under the General Head "Public Works Establishments," with such minor heads as may be deemed necessary for proper classification. The charges for the Board of Public Works, for the Inspecting Engineer, and for the District and other Executive Engineers, might be shown separately; also those of Commissioned Officers, Warrant and Non-Commissioned, the Native Executive Department of Foremen and Surveyors, and the office Establishments. The entries in the local books will be closed to "General Books." If it is deemed expedient to charge the cost of the Establishments in shares to the several Departments the partition had better be made in the Accountant General's office so as to avoid complicating the local books. It will be proper that the Board of Public Works should be kept acquainted with the cost of the Establishment; and for this purpose a statement should be sent to them annually by the Accountant General, showing the charges for the year, in the same classification and arrangement under which they appear in the General Books.

Variable and office
allowances.

517. And not merely salaries and fixed allowances should be thus dealt with; but variable allowances also, such as Horse allowance and tentage, should also be submitted to the proper audit office. At present all such allowances both in the Public Works Department and the Revenue Department are checked by the Board of Revenue; but this appears to be a false distribution of duties, an imposition on the Board of functions which do not belong to it. The variable allowances are regulated by fixed rules not less strictly than the invariable, and there is no more difficulty, or any more necessity for peculiar or departmental knowledge, in applying the rules in the latter than in the former case. Accordingly, in the Military Department, all such variable allowances are checked, equally with the fixed allowances, by the audit office, and the same ought to be the practice in the Revenue Department also. It may perhaps be deemed fit to give the Board power to stop those allowances or some of them as a punishment for inactivity or misconduct; but that is a totally different thing from the auditing of the allowances under known rules, and need not be at all mixed up with it. Whenever the Board, being vested as they properly may be, with such power, find it necessary to put it in operation, they will simply pass this order, and then notify to the Audit Office the stoppage made; and that Department will see that the decision is carried into effect.

So also office allowances if given in any case, allowances for Stationery, for Saderwarid, and any other similar allowances, should be audited by the Audit Office. There is nothing peculiar in those allowances, such as to require peculiar or departmental knowledge to deal with them. The proper office for controlling and checking them therefore is that which checks salaries and allowances generally. The Board of Public Works ought not to be encumbered with duties which are as foreign to their proper Province, as the control of the Public Works is to that of the Audit Office. But contingent charges not fixed, whether discretionary or incurred under estimate, should be under the control of the departmental Board; and the bills for them should be dealt with like those for works executed.

We will only add that it is very desirable that tables of the rates of pay and all allowances for all grades of officers, should be printed and in the hands both of officers drawing abstracts and of those paying them. The rules for deductions in case of absence on private leave or on medical certificate, and for the allowances payable to officers acting for such absentees, as well as those regulating the variable or contingent allowances, should be similarly printed and generally circulated. This will very much facilitate business.

PART V.—THE MODE OF PROVIDING FUNDS FOR PAYMENTS IN THE TALOOKS.

518. With reference to the course which we have proposed for supplying the executive Officers with funds, it is proper that we should here advert to the mode of conveying the money to the place of the expenditure, remote as that will often be from the Collector's Treasury. And in doing this we shall be obliged to consider the mode of supplying funds in the Talooks for all payments; because the system proper for payments generally, will be proper for those on account of Public Works, and the converse. The general method of supplying funds for all expenditure in the Talooks at present, is to transmit specially from the Collector's Treasury, every sum so required, whether large or small. All the revenues are collected in the Talooks, and the amount collected is sent up to the Collector's Treasury; and, with some limited exceptions, every sum required to be expended in the Talook, whether the pay of Talook Establishments, advances for Public Works, or other, is sent back again. The collections made in each month are sent off from the Talook so as to reach the Collector's Treasury before its close, and the guard of peons which escorted the remittance returns to the Talook. About the 8th or 10th of the following month, when the Tahsildar's monthly rolls of Pay &c. of the Talook Establishment have been examined at the Collector's Office, another guard is required to go up again to bring the amount to the Talook. There are also various other sums requiring to be sent to the Tahsildar in the course of the month either advances for Public Works, the pay of Tappal runners, of Pensioned Sepoys, or other. The pay of these classes cannot be issued so soon as that of the Talook Establishments because the monthly rolls have to receive the sanction of other Departments. The Talook stations are distant from the Collector's station, fifteen, thirty, fifty, and in not a few cases seventy and eighty miles. The frequent long journeys required by the existing system occupy a large proportion of the Peons of a Talook; and to reduce this waste of time to a minimum, a Tahsildar is often compelled to put off sending for money till he has occasion to send to the Collector on some other account; and thus the arrival of funds and the distribution of pay are very much delayed. This is one practical evil of no little magnitude. Another is the consumption of the time of a considerable number of Peons out of the limited Talook Establishments to the very great impediment of other business.

Coin for Talook
payments is now
carried from the
Talook to the
Collector's Treas-
ury and back
again.

519. And the operation of the system is not confined to the Talook payments, it extends to the Military Paymaster also. Thus the Vellore Paymaster requires monthly about 70,000 to 90,000 Rupees, which is brought from the Collector's Treasury at Chittoor twenty-two miles distant, a Military guard being sent from Vellore to fetch it; and yet at the very same time the Revenue Collections of the Vellore Talook and of other Talooks beyond, are sent monthly to Chittoor, only to be sent back again to Vellore. Nor is this all: the Vellore Paymaster has to make payments at the Stations of Arnee and Arcot; and this he does by sending to those places (respectively distant from Vellore 23 and 14 miles) under Military escort, portions of the coin procured from Chittoor in the mode above described and yet Talook remittances on their way to Chittoor pass monthly through both those places. And it is the same with the pay of the Establishments of the District Moonsiff's Court; the funds for this purpose are sent up to the Collector's Treasury with the monthly remittances only to be sent back in a week or two. And in fact it may fairly be said that a large body of the servants of Government are continually employed in conveying coin from one place to another, and in carrying it back again.

And it is the
same with funds
supplied to the
Military Pay-
masters.

520. This practice of continually carrying coin fifty or eighty miles merely that it may be carried back again appears so obviously a waste of labour, that it might be supposed that it would only be necessary that it should be brought to notice in order to its being abolished. But this is not the case; within the last two years the circumstances have been several times under the special consideration of the Government, and the result has only been that the practice has been

The practice has
recently been
made more strict.

affirmed, and the rule made even stricter than it was before, in some Districts at least.

On the 14th October 1851, in consequence of its having come under the notice of Government, that in Chingleput District certain payments were made direct from the Talooks, though only on special orders in each case from the Collector, an order was issued by the Government, directing that in every District "the practice should be peremptorily and finally abolished forthwith, and that no sum however trifling should be on any account paid from the Talook Treasury out of the collections, except in an *emergent* case; and then only by a special order under the signature of the Collector or in his absence of his Head Assistant in charge of the District." This order was communicated to all Districts by Circular; and a number of the Collectors immediately remonstrated, pointing out the serious inconveniences which would result from the enforcement of that order; and stating the cases in which it had been customary in their Districts respectively to permit disbursements direct from the Talook Treasuries. The greater part of the disbursements enumerated were in payment of troops stationed at posts remote from the Collector's Treasury; but the number included also the pay of the Civil Engineer's Establishments; and in some cases, that of the Talook Establishments, where very distant. Of these letters we give in Appendix B that from the Collector of Canara, which states the merits of the case very clearly. The Board of Revenue who had previously, on more than one occasion expressed themselves in opposition to any disbursement direct from the Talook Treasury, were induced by these representations to change their opinion; they laid the letters before the Government, with a recommendation that the recent restriction on disbursements from the Talook Treasuries should be removed, but that every such disbursement should be on special order from the Collector. The Government declined to accede to this recommendation, but admitted a slight relaxation of the former order, to the extent of omitting the word "*emergent*," and leaving it to the Collector to determine what payments were necessary to be so made.

Further orders.

521. Subsequently, on receiving further objections from several Collectors pointing out that it would be impossible to carry on the Service of Government efficiently, under the order of Government referred to, even in its modified form, the Board of Revenue were induced to address Government again. They pointed out that there were a great variety of small payments of constant recurrence in the Talooks, the exact amount of which could not be known beforehand, and the disbursement of which could not be delayed for the receipt of orders from the Collector in each case, without embarrassment to the Public Service; while such constant references on petty matters would enormously increase the work of a Collector's Office, already very heavy. And they recommended, in accordance with a suggestion from the Collector of Canara, that Collectors should be authorized to place in the hands of every Tahsildar a small sum from which to make those payments; the disbursements to be audited monthly by the Collector.

The plan here proposed was not new: it was adopted in the Ceded Districts at the beginning of the century by Colonel Munro, and being brought to the notice of the Board of Revenue in 1815 was then ordered to be introduced in all Districts, but appears to have since fallen into disuse in some. On the present occasion the proposal obtained the approval of Government and has been carried into effect; each Tahsildar being supplied with an "advance fund" varying from one hundred Rupees to five or six hundred, out of which small necessary disbursements are made, the amount being replaced as soon as the monthly accounts can be audited by the Collector.

Present condition of the rules.

522. This then is the present position of the question. The general rule is that all sums received in the Talooks on account of Government shall be sent up to the Collector's Treasury, and all sums needing to be disbursed in the Talook shall be specially sent back again from time to time, as occasion requires. The exceptions to the rule are, 1st that the salaries of Civil Engineers and their Establishments, the amount of bills drawn on Collectors by Officers of Government, the pay of Troops at some few stations, and some few other disbursements, and generally such payments as a Collector may think sufficiently pressing to be made an exception, though not absolutely necessary, may be made out of general funds in the Tahsildar's hands, though only on special orders from the Collector in each instance. In one or two of the foregoing cases it is allowed to the Tahsildar to retain funds of the month's collections to meet the payment. But these are few; in general no amount is allowed to be detained even a single day, to meet any payment; all are to be dependent on the chance contents of the cash chest.

The other exception is that small payments of frequent recurrence, and necessary to the carrying on of the service of Government, may be made from a fund specially lodged in the hands of the Tahsildar for that purpose.

523. We beg to submit that the rules are still much narrower than the efficiency of the service requires, and than they might be made with perfect security; and in support of that opinion we beg to urge the following considerations. They are too narrow.

It appears to us that the recent orders were passed under a double misconception; 1st as to the existing practice, and the exact nature of the measure recommended, and 2d as to the value of the check which would accompany that measure.

The Government appears to have supposed that the making payments from the Talook Treasuries, implied their being made at the discretion of the Tahsildar; and they insist therefore that no such payment shall in any case be made without a special order from the Collector for the exact sum to be disbursed. Undoubtedly this is right and necessary, and relaxation on this point would be dangerous and improper; but it does not appear from any part of the correspondence that payments without special and definite orders from the Collector had ever been allowed in any District, with some trifling exceptions of the nature adverted to above in Para 521, and the recommendation of the Board of Revenue had expressly contemplated such special warrant for every payment.

524. But, secondly, those orders appear to indicate a forgetfulness of the nature and the efficacy of the control afforded by accounts. In point of fact when money is once brought into the books of the controlling office, and is not allowed to be issued again without a special order from that office, it is as secure, and as much under the control of the Superior Officer as if it were actually in his cash chest.

The change advocated would not increase the trust placed in the Tahsildars.

It appears to us that the question at issue has no reference to the degree of confidence of which the Tahsildar may be deserving, for the change advocated would not at all increase the trust reposed on him. The check over the Collection and receipt of the Revenue by the Tahsildar would be precisely the same as at present, and those on his disbursements would also remain exactly the same, or rather, they might be much increased, by a better system of account. And with regard to the amount of money to remain in the Tahsildar's hands at any given time; that would be diminished and not increased. In proof of this assertion, we beg to refer to what is said above in para 442 as to the advances for Public Works in the Revenue Department. The cash for such advances is now sent to the Tahsildar in large sums, and under the present system of delays, these amounts remain for months in the hands of the Tahsildar; under the new system, the amount left in his charge each month would be carefully adapted to the demands of that month. Thus in this large item of Talook expenditure the funds in the Talook Treasury would be diminished; and as to the other items, including the salaries of the Talook Establishment, the only difference would be that instead of sending up the coin required for his disbursements and getting it back again in a few days, the Tahsildar would retain it in his own Treasury during that short interval.

525. On these grounds we contend that the proposed change would not increase, and would even diminish the pecuniary trust now placed on the Tahsildar; but even admitting that such trust would be increased under the new arrangement, we maintain that the trust reposed on him in this regard would still be very far within the similar confidence already devolving on him in other matters. The Tahsildar is trusted to collect the revenue of his Talook from perhaps eight or ten thousand separate contributors, with very much latitude as to the particular times at which he collects from each, and to keep the accounts of all the collections. He is trusted also even in settling the revenue of each individual for the year, and in making remissions, perhaps to several thousand separate individuals; for it is upon his information chiefly and almost exclusively, that such points are determined. And it cannot be denied that both in settling and in collecting the revenue of a Talook there is very much scope for fraud. For in both operations thousands of persons are concerned, to the aggregate amount of probably two lacs of rupees yearly; and many of these persons are anxious to obtain advantages which they may or may not be entitled to, but which in either case are worth paying for. So also the Tahsildar is trusted to disburse ten or twenty thousand Rupees a year for Maramut works, with no better check over his proceedings than is afforded by the very loose system of accounts described above in our third Section, which in reality keeps the controlling office entirely in the dark. And yet while the Tahsildar is habitually

And he is already trusted much more largely in other ways.

trusting with these large powers of collecting and disbursing money, practically under no efficient check at all; yet when it is proposed to permit him to retain in his own cash chest, a few hundred or possibly sometimes two or three thousand Rupees for ten or fifteen days, and this not only under the guarantee of the chief two servants of his Cutcherry jointly with his own, but under the strict and invariable rule that no Disbursement shall be made without a special order from the Collector, alarm is taken, and the proposal is rejected as a dangerous innovation.

Examples from the practice of Nellore and Canara

526. But the arguments in favour of the course which we advocate are not confined to abstract reasonings, we can appeal to the results of actual practice. In the Nellore District it was for many years the custom to make all payments in the Talooks out of the funds collected, and to remit only the balance to the Collector in cash. The Sub Collector in charge of the District, in replying to a call from the Board of Revenue for explanation of this practice,* expressly declares that he cannot call to mind one instance during his employment in the District, (then extending to above nine years,) in which the practice has led to any abuse, and that it is attended with many advantages. So also in Canara, the same practice existed apparently from the earliest days of British rule. In his letter above noticed, urging objections against the enforcement of the order of Government of the 14th October 1851, the Collector who had an experience of ten years in the District, speaks of the existing practice "as having proved in so many respects highly advantageous." And again, after enumerating some of the principal payments habitually made from the Talook Treasuries, he adds "I can safely say that these arrangements are of advantage to the service of Government. They expedite the Public Service; they assist Trade; they render property more secure; and they save the services of a vast number of Peons who must otherwise be constantly employed in conveying money all over the country." See Appendix B Para 10. If the practice had been found to lead to abuse, Mr. Malby would certainly not have failed to notice the fact; whereas he does not even advert to the possibility of such a thing. The great length of the District of Canara, and the consequent long distances from point to point within it, would make the operation of the Rule laid down by Government more inconvenient there than in most Districts; but in other respects there is nothing exceptional in the two Collectorates here named. The inconveniences of the prevailing system are felt in every District in proportion to its extent and to the number of its transactions; and as the opposite course has led to no frauds or abuses in Canara or Nellore, so there is no reason whatever to anticipate such in any other District.

The exceptions allowed by Government justify the entire abrogation of the rule.

527. We have seen that the Government have been constrained by the great inconveniences which would result from a strict adherence to the rule which they had laid down, to allow some relaxation of it. Those exceptions are for the most part in favor of troops posted eighty or ninety miles from the Collector's Station; and the Government also appear to have tacitly sanctioned the order issued by the Accountant General in 1815, permitting Collectors to pay from the Talook Treasuries the amount of his own bills on them. We are unable to perceive why the two classes of persons affected by these exceptions though justly entitled to consideration, can fairly claim more favor than other classes. It is not less a hardship to Talook Officers of all grades, or to the Establishment of a Moonsiff's Court, or to the Tappal runners, to be kept without their pay, than to Sepoys to be kept without their pay or to merchants to wait for remittances; and as the delay in the one case is thus officially recognized as an evil deserving a remedy, we contend that consistency requires that it should be so also in the other. And to look at the other side of the question; the inconvenience to the Public Service, the loss of time of numbers of servants of Government engaged in going backwards and forwards for money, is probably not greatly diminished by these exceptions, because the same guard which took the Civil Establishments pay would generally take that of the Military also; and because the number of these Military outstations is small.

Again, it is not to be supposed that Government or the other authorities concerned, believed at all that in allowing these exceptions they were doing what would in any degree endanger the safety of Government Funds; they must therefore be held to have admitted the principle for which we contend, viz. that accounts and vouchers duly rendered afford as secure a guarantee for money as the actual handling of the coin. We trust therefore that the restrictive rule will be wholly abrogated, and that this principle will be put in operation in transactions between the

* Letter 23th May, 1844.

Collectors and their Subordinate Treasuries, as it is already between the General Treasury and the Collectors. In both cases the real guarantee against misappropriation is less the integrity of the Officers, than the accounts and vouchers rendered; and if it is necessary that all the Talook collections should be deposited in the Collector's treasury before being paid out, it is difficult to avoid the conclusion that all the district collections ought to be brought to the General Treasury at Madras, before any disbursement is permitted.

528. With a simple set of accounts easily kept, with a small degree of attention on the part of the Collector, with due care not to allow more money to remain in the Talook Treasury than its probable Disbursements during the month will amount to, and with the precaution of occasionally examining the Talook cash chests, it is difficult to perceive what injury or danger could result from the course which we advocate. Much vigilance is already exercised over the Talook cash chests; and in many districts, perhaps in all, it is required that the account should be balanced every evening, and the book laid on the cash chest. And from time to time the cash is examined and compared with the accounts, by one or other of the European Revenue Officers of the District. But the practice of keeping separate accounts of every amount received for a particular purpose, and of keeping every sum of money so sent in a separate bag, both complicates the account and makes it difficult to see what the real balance is, and also renders it a work of time and difficulty to ascertain how much coin the chest really contains. Both these sources of confusion would be removed under the new system. The account would be closed every evening, as at present, and as it would be only a single account the balance could be seen at a glance; and as the contents of the cash chest would be all together, it would be simple and easy to ascertain their amount.

The Talook cash accounts should be balanced daily; & the cash chest occasionally examined.

529. So also it is even now the custom for the Tahsildar to send to the Collector every month an account of his receipts and disbursements; but these accounts are not always by any means clear, nor are they perhaps very carefully scrutinized. We give in Appendix L L the form of an Account Current such as would answer the purpose, complete for one month as taken from the accounts of the Poonamallee Talook. Such an account would exactly inform the Collector of the state of every Talook Treasury and of its transactions during the preceding month. In order to enable him to arrange beforehand for these transactions, to fix exactly the amount to be retained by each Tahsildar out of his collections, he must have previous intimation of the demands expected in each Talook in the course of the succeeding month. Every Tahsildar therefore should send to the Collector on the 25th of every month, as above provided, an estimate of his probable collections between that time and the 25th of the following month, and of his probable expenditure during the same period; and the Collector, with this document and the statement of the probable drafts of the Engineer Department will have no difficulty in fixing the amount which each Tahsildar should retain out of his collections, as already pointed out in para 482. In Appendix M M we give a form for this monthly Estimate; the form should be printed, and filled up by the Tahsildar.

A monthly Account Current to the Collector.

530. We cannot forbear to add that the apparent security at least, and we think the real security likewise, will be greatly increased if both this Estimate and the Account Current are in the English language. We are aware that the adoption of English for the District Accounts is objected to, and that it is argued that if it is desired that the European Officer should be able himself to refer to those accounts, he ought to be required to learn the Native language in which they are kept; that the few ought to be obliged to learn a new language rather than the many. This reasoning however appears to us unsound. It seems a plausible objection that for twenty persons to learn a language involves more trouble than for one to learn it, but it will not bear examination. For, of twenty or thirty persons learning, each only learns the same as the one; and whether an individual learning is one of a number or stands by himself matters nothing.

These accounts should be in English.

But in the case before us the chief consideration is that the few cannot be made to learn the language sufficiently, while the many can. Every Collector and Assistant, probably without an exception, is quite sufficiently conversant with one or more of the local languages to transact his business in it with facility; and to communicate freely with the people of his District; but not one in thirty is able to read and write a Native language with perfect readiness; nor is such familiarity at all necessary to the efficient discharge of his duties. We say then that the European Officer cannot be made generally to acquire this facility, for the mere purpose of the occasional

examination of accounts, because such a knowledge must form but a small and insignificant part of his qualifications for the performance of his whole duty; but the subordinate writers and accountants may be made to learn English, because the knowledge of the official language constitutes with that class a very large part of their necessary qualifications: in their case therefore it may properly be made an essential condition of employment, while in the former case it cannot. And here indeed we can appeal to a case exactly in point, viz. that of a strange language acquired by numerous classes as a qualification for Government employ. The Mahratta language which in most Districts is used for the accounts, and is in some (or was till a late period) even for general business, is the native Tongue only of a few Mahratta Bramins, and is as foreign to the people generally as English; and yet numbers of Tamil and Telooogo young men habitually make themselves familiar with this language in addition to their own, because under the present system it is a necessary condition of employment in the Revenue Department.

Sufficient knowledge of English would be easily obtained.

531. And there are various circumstances, showing how easily the knowledge of English required for the purpose in view might be ensured. Wherever a capability of writing English is required it is forthcoming for a very small remuneration. Many Cutwal's writers throughout the country, at the Military Stations, where they are required to be able to write an English letter, receive no more than 7 Rupees a month; the accounts of every troop and company in the army, intricate as they are, are kept in English by a person receiving merely the pay of a Sepoy, which in the Infantry is only from 7 to 10½ Rupees a month; all the accounts of the Commissariat Department are kept in English, and the majority of the Canacapillays who keep them receive only 10½ Rupees monthly; lastly, at every Station in the Interior there are numbers of young men who gain their only livelihood by writing Petitions in English, and who would most gladly give up that occupation, for a Government appointment with a very trifling salary; their knowledge of the language is superficial, but it is far beyond what would be wanted for the object now under consideration. These instances, we think, if they prove nothing else, prove at least that the means of acquiring a knowledge of English sufficient for the purpose in view, are very general throughout the country. And there seems no room for doubt that a man might at once be readily obtained in every Talook over the whole Presidency, capable of writing the accounts in question in English; and no more doubt that the present Gomastahs would themselves, if required, acquire the requisite knowledge in a very short time.

Documents purely official need not be in the Vernacular.

532. One word as to the propriety of having these accounts in English, and not in the Vernacular. It is undoubtedly proper that all depositions should be taken in the language of the deponent, and all orders ought to be written in or translated into the language of the parties affected; but as respects all papers of merely official use, the only consideration is official convenience and advantage. The expediency of placing the Talook monthly accounts in such a form as to be intelligible at a glance by the Collector seems unquestionable, and we can see no objection whatever to such documents being in a language unknown to the people at large, because they are not at all designed for the use or inspection of the Public. And as to this objection, we may add that those accounts are already in most Districts, written in a language quite as foreign to the people generally as English, viz. in Mahrattah; with this difference that this is the language of the Sheristadars, but is much less familiar to the Collector than even the local language, and is generally wholly unknown to him.

SECTION VII.

ON THE MODE OF RECORDING THE CHARGES FOR PUBLIC WORKS
IN THE GENERAL BOOKS OF ACCOUNT.

PART I.—THE PRESENT PRACTICE DESCRIBED, AND ILLUSTRATED BY EXAMPLES.

533. In this Section we propose, first to examine the existing practice as to the mode of exhibiting the charges for Public Works in the General Books; and secondly to offer some suggestions with the view of improving the system in this respect. Introductory.

The Territorial Journal and Ledger form the grand Record of all the pecuniary transactions of the Government. A separate set of books indeed called the Military General Books, is kept of the transactions in the Military Department, which are therefore recorded in detail there; but even those Military charges are brought into the Territorial books in the mass. The "Financial Statement" as it is called, which is prepared for immediate information because the compiling of the Territorial books is so long delayed, is used for some purposes; but that Statement is unauthentic and even deceptive in some particulars, and the Territorial books are the only real and authentic record. These books are compiled from the journals of the several Collectors and other Public Officers who keep accounts. We shall here speak of them however only so far as they concern the Public Works; and the materials of their formation, as respects those works are the Collectors' journals, the Military General Books, and the journals of the Superintendent of Roads, of the Superintendent of Public Roads at the Presidency, and the of Sub-Treasurer to Government. We shall first describe all these, and then detail the system and arrangement of the General Territorial Books; and lastly we shall state the changes which appear to us desirable.

534. The heads of advances for Public Works in the Collectors' journals are two, viz. The Collectors' journals,

- | | |
|---|--|
| 1. Advances for repairs of Tanks and Water courses. | 2. Advances on account of the Service of Government. |
|---|--|

The heads of charge are as follow:

- | | |
|---------------------------------------|---|
| 3. Repairs of Tanks and Watercourses. | 12. Repairs of General Buildings. |
| 4. Repairs of Roads. | 13. Repairs of Ecclesiastical Buildings. |
| 5. Public Roads. | 14. Repairs of Marine Buildings. |
| 6. Buildings Revenue. | 15. Civil Engineers. |
| 7. Buildings Judicial. | 16. Superintendent of Roads. |
| 8. Buildings General. | 17. Ordinary General Miscellaneous charges. |
| 9. Buildings Ecclesiastical. | 18. General charges extraordinary. |
| 10. Repairs of Revenue Buildings. | 19. Marine charges. |
| 11. Repairs of Judicial Buildings. | 20. Military Books. |

The following are the heads of Refund:

- | | |
|---------------------------------|--------------------------------|
| 21. Refunds of Revenue charges. | 23. Refunds of Marine charges. |
| 22. Refunds of General charges. | |

The following are the heads of transfer entries.

- | | |
|-------------------------|------------------------|
| 24. Engineers Revenue. | 26. Engineers General. |
| 25. Engineers Judicial. | 27. Civil Buildings. |

The following are the closing entries :

28 Charges General of the Revenue Department.	31 Charges General of the Marine Department.
29. Charges General of the General Department.	32. Remittances of the Revenue Department.
30 Charges General of the Judicial Department.	33. Remittances of the General Department.
	34. General Books,

And the following are the heads for the closing entries of Refunds :

35. Extra Revenue.	37. Marine Receipts.
36. Extra General Receipts.	

Remarks on the heads;

535. A few brief explanatory remarks seem proper, on each of the heads of advance and of charge.

The heads of advance.

1st. Advances for repairs of tanks and watercourses.—The title fully explains the object of this head. The debits are adjusted from time to time as bills are sanctioned for work done, by crediting this head and debiting that of "Repairs of Tanks and Watercourses." Recoveries are credited to the same head. Advances outstanding at the close of the official year are transferred to the head of "Advances on account of the service of Government," which is closed to General Books.

2nd. Advances on account of the service of Government. Under this head are debited all advances for roads, buildings, or other Public Works. It contains four minor heads, viz. Revenue, Judicial, General, and Marine. The advances are adjusted by bills like those last spoken of. Recoveries are credited to the same head; it is closed to General Books.

The heads of charge.

Repairs of Tanks;

536. 3rd. Repairs of tanks and watercourses.—Under this head are debited every month the salary of the Collector's Maramut Establishment. And when bills are sanctioned for work done, their amount is adjusted by a debit to this head, and a credit to the head of "Advances for repairs of tanks and watercourses." In Tanjore and Masulipatam it is the practice to make the adjustment before the receipt of the sanction to the bills, and as soon as they are despatched to the Board. This head is closed to "Charges General of the Revenue Department;" and that to "General Books." Recoveries of amounts charged under this head are brought to account under the head "Refunds of Revenue charges," with the minor head "Repairs of tanks and watercourses." The head of "Refunds of Revenue charges" is closed to "Extra Revenue."

Repairs of Roads;

4th. Repairs of Roads.—Under this head are debited charges incurred by the Collectors in the repair of the district roads and bridges. Any recoveries of charges under this head are credited to "Refunds of General Charges;" which is closed to "Extra General Receipts." The head "Repairs of Roads" is closed to "Charges General of the General Department;" and that to "General Books."

In the Journal of the Superintendent of Roads also the same head is opened; and to it are debited the whole charges of that Department, including the construction of roads and bridges as well as merely repairs, and also the salary of the Superintendent himself and his establishment.

Public Roads.

5th. Public Roads.—To this head are debited charges incurred by Collectors for the construction of roads and bridges; similar works constructed in the Road Department are charged as already said to the head "Repairs of Roads." In some Collectorates the salaries of the Executive Officers in charge of ghauts and roads, and of their establishments, are also charged to this head. It is closed to "General Charges Extraordinary," and that to "General Books." Recoveries are credited to "Refunds of general charges," with the minor head "Public Roads."

New Buildings.

537. 6th. Buildings Revenue.	8th. Buildings General.
7th. Buildings Judicial.	9th. Buildings Ecclesiastical.

New buildings, as well as extensions and enlargements of existing buildings, are charged under these heads, according to the Departments to which they respectively belong. The general practice is to adjust the amount after the bills have been sanctioned, by crediting "Advances on account of the service of Government," and debiting the proper head of charge; and this is the course approved by the Accountant General. But in some Districts, as Tanjore, Canara, Malabar,

Masulipatam and Rajahmundry, this adjustment is made before the receipt of sanction to the bills; and in Coimbatore, Chingleput, Cuddapah and Salem, the practice prevails of debiting at once as charges, to the proper Department, the amounts sent to the Tahsildars from time to time as advances for works of these descriptions; sums returned as unexpended in those Districts are credited to the head originally debited. These several heads are closed at the end of the year to "Civil Buildings;" and that is closed to "General Books."

10th. Repairs of Revenue Buildings.	13th. Repairs of Ecclesiastical Buildings.
11th. Repairs of Judicial Buildings.	14th. Repairs of Marine Buildings.
12th. Repairs of General Buildings.	

Repairs of Buildings.

Charges incurred in repairing buildings belonging to the several Departments here specified, are debited to one or another of these heads accordingly. We must however except repairs of Marine buildings, to which the same rule does not apply universally. This head is opened only in the Military Books, and in the Journal of the Malabar Collectorate; many Collectors have to incur such charges, but except in the District just named, and in the Presidency Division in which the work is under the Military Board, such repairs are included with various miscellaneous items under the head "Marine charges."

Charges are debited to these heads by adjustment from the advance head, after the bills for the work have been sanctioned; but the same practice noticed under the head of Buildings Revenue &c., prevail with respect to these charges also and in the same Districts.

538. 15th. Civil Engineers.—The salaries of the Civil Engineers, of their Assistants and Subordinates, and of all their establishments, are charged monthly to this head. At the close of the year the amount is subdivided; seven-eighths of the whole being transferred to the head of "Engineers Revenue," one-sixteenth to "Engineers Judicial," and one-sixteenth to "Engineers General." Then the first of these heads is closed to "Charges General of the Revenue Department," the second to "Charges General of the Judicial Department," and the third to "Charges General of the General Department," and the whole three Heads are then closed to General Books. Recoveries of sums charged under this head are credited to the same head.

Civil Engineers' Salaries and other charges.

16th. Superintendent of Roads.—Sums disbursed by the Collectors to the Superintendent of Roads for the execution of work to the Trunk Roads, are debited under this head. The head is closed to Remittances of the Revenue Department; and that is closed to General Books. Recoveries under this head are credited to the same head. Amounts unexpended out of sums drawn for particular estimates are generally repaid into the General Treasury of Fort Saint George.

17th. Ordinary General Miscellaneous charges.—The salaries of the Collectors' Maramut Establishments which in other Districts are charged to "Repairs of Tanks and Watercourses," are charged in Malabar and Canara to this head, because in those two Districts there are no Irrigation works. The head contains a variety of other charges, some of them not at all pertaining to Public Works. It is closed to "Charges General of the General Department;" and that is closed to "General Books." Recoveries are credited to "Refunds of General charges."

18th. General Charges Extraordinary.—Under this head, which contains also items not connected with Public Works, appear charges for the repair and construction of Ferry boats. It is closed at once to "General Books." Recoveries are credited to "Refunds of General Charges."

19th. Marine Charges.—This head of account contains charges for the construction and repair of Flagstuffs, beacons, light houses, and other buildings of the Marine Department. It also contains some other charges not belonging to Public Works such as the pay of Marine Establishments, hire of boats &c. It is closed to Charges General of the Marine Department and that to General Books. Recoveries are credited to "Refunds of Marine charges."

20th. Military Books.—Charges incurred by Collectors for the repair or construction of Barracks and other Military Buildings are debited to this head. Recoveries are credited to the same head. It should be added that this head of account in the Collectors' journals comprises a variety of charges wholly unconnected with Public Works. It is closed to General Books.

539. The Journal of the Sub-Treasurer, in every respect as far as his transactions extend, resembles the Journals of Collectors. His transactions in this department however are few. He advances cash to the Superintendent of Public Roads for the performance of work, and he pays

The Sub-Treasurer's Journal.

the salaries of the Establishment of that officer, of the Superintendent of Roads, and of what is called his fixed Establishment, and of the Secretary and Establishment of the Public Works Department of the Board of Revenue. His payments to the Superintendent of Roads are debited in the same manner as the similar disbursements by the Collector. Sums advanced for the performance of work to the "Superintendent of Public Roads" are debited to that head; which, is closed to "Remittances of the General Department," and that to "General Books." But the salaries of the Establishment of the officer are debited to "Repairs of Roads, as are also certain charges for House Rent, &c. We may here observe that confusion arises from these two terms Superintendent of Roads, and Superintendent of Public Roads. The former signifies the head of the Road department, who has charge of the formation and maintenance of several lines of Road throughout the country; the latter is the Officer charged with the repair of the very small extent of road at the Presidency not transferred to the charge of the Assessment Board, being about thirty-four miles. The titles are far from expressing the duties of these Officers. The Superintendent of Roads has not the control of the roads of the country at large, as his designation indicates, but only of a limited extent; and again the "Trunk Roads" under his charge are not less "public" than the roads at the Presidency. There is a further cause of confusion; viz. that the Superintendent of Public Roads, though so styled in the Books of the Accountant General's Office, is called "Superintendent of Government Roads" in his own books and in those of the Sub Treasurer.

The books in the Military department.

540. The principal books of account of the Public Works in the Military Department are the following; 1st. The Journals of the Military Paymasters; 2d. The Journal of the Transfer Department of the Accountant General's Office; and 3d. the Military General Journal compiled in the Accountant General's Office. Besides these there are accounts particulars, accounts current, Register books, &c. in the several Departments. The following is the mode in which the three principal books are kept.

The Paymasters' Journal.

The Paymaster's Journals show only the advances made for the execution of work, not the actual charges. They also show under the head "Engineers," the salaries and allowances of the Engineer Officers and their establishments; and in the Presidency Division there is another head opened, viz. General Department, under which is exhibited some part of the charges of the Public Works Establishments. In this Department advances for any Public Works are made to the Officer charged with the execution; with the minor head to which the charge is ultimately to be adjusted; in some cases the Officer thus receiving is the Station Staff Officer, and in the case of small stations he is the Commanding Officer. All such advances, to whomsoever made, are entered in the journal to the personal debit of the Officer receiving, as already explained; and at the close of the year all these personal debits, as well as the other two heads, of "Engineers" and "General Department" are closed to the head "Military Books." Thus the advances made are brought into the Books of the Accountant General's office and (contrary to the practice of the Revenue Department) the adjustment of those advances is made in the Accountant General's office and not in the local and subordinate journals.

Extracts from Paymasters' journals in illustration.

541. We extract some entries from the journals of the Paymasters of both the Presidency and the Centre Division, and will add a few remarks.

Paymaster of Vellore.

SUNDRY ACCOUNTS DR. TO CASH.

1. Captain N. S. Wilson Acting Local Staff Officer in charge of Military Buildings at Vellore.

Repairs of Military Buildings.

Amount paid to him for repairing the Staff Serjeants' Quarters within the Fort of Vellore as per his receipt dated 21st May 1850 and authorized in a letter from the Staff Officer in charge of Military Buildings Centre Division No. 170 dated May 25th 1850 No. 637..... 41- 4- 5

2. Major J. Mann Commanding Wallajahbad.

Repairs of Military Buildings.

Amount paid to him for repairing the Hospital No. 6 of the Cantonment of Wallajahbad as per his receipt dated 20th November 1850 and authorized in a letter from the Staff Officer in charge of Military Buildings Centre Division No. 397 dated 22d November 1850..... 49-11- 4

CASH DR. TO SUNDRY ACCOUNTS.

3. Major C. G. Otley in charge of Military Buildings at Vellore

Repairs of Military Buildings.

Recovered as per Account Particular No. 20 sent to the Accountant General..... 8-15- 7

SUNDRY ACCOUNTS DR. TO MILITARY DISBURSEMENTS.

4. Engineers.

Centre Division.

Arrears for April 1853.

1st Lieut. G. C. Collyer..... 234-14- 0

2nd Lieut. E. A. Ford..... 192-10- 6

Fixed Establishment of Bricklayer and Carpenter Maistry and Conacapilly as per abstract account of Disbursements sent to the Military Auditor General..... 45- 8- 0

Presidency Paymaster.

SUNDRY ACCOUNTS DR. TO CASH.

5. Captain R. L. Reilly Assistant Superintending Engineer Presidency Division and in charge of the Superintending Engineer's Department.

Repairs of Military Buildings.

Advanced to him for repairing, white and blue washing, &c. the buildings designated into Cadets Quarters in Fort St. George, now occupied by the Officers of Her Majesty's Regiment, on emergency; as per his receipt dated 11th May 1850, upon the instruction of the Accountant Military Department dated 27th March 1850, No. 3267..... 123 15- 5

6. Captain J. Maitland Superintendent of the Gun Carriage Manufactory at Madras.

Paid to him being the amount of his Bill dated 21st January 1850 for repairing the buildings of the Gun Carriage Manufactory, as per his receipt dated 28th May 1850, upon the instruction of the Accountant Military Department dated 27th of that month No. 257..... 4- 8- 3

7. Soobroya Meodelly Contractor.

Paid to him being the balance of his Bill for erecting Barrack within the compound of the Government Garden at Guindy as per his receipt dated 18th May 1850, upon the instruction of the Accountant Military Department dated 6th of that Month No. 49..... 70- 2-10

8. P. Parthasarathy and P. Vencatasamy Maistries.

Paid to them being the balance due to them on their Bill dated 18th October 1849 for repairs of Buildings in the Military Department as per their receipt dated 10th November 1849 upon the instruction of the Accountant Military Department dated 6th of that month..... 1,086- 4- 4

SUNDRY ACCOUNTS DR. TO MILITARY DISBURSEMENTS.

9. Engineers.

Arrears for April 1850.

At the Presidency.

Lieut. Colonel A. Lawe Chief Engineer his pay Garrison and Staff allowance. 2,232- 4- 0

Lieut. Colonel A. T. Cotton his pay and allowances from 1st to 10th as Major from 11th to 30th April 1850 as Lieut. Colonel..... 735- 8-10

542. The heading to the advances for Public Works as expressed in the journal contains nothing to show that it relates to Public Works, which can only be learnt from reading the item below; this will be seen in entries 2, 6, and 7, given above. In some cases the minor head to

Remarks on the foregoing.

which the charge is ultimately to be debited is omitted; see entries 6, 7, and 8; and in the last mentioned even the particulars of the work are not given, but only the general description "Repairs of Buildings." It will also be seen from entry No. 3 that when recoveries are made out of sums advanced, they are credited without any details except the minor head, the details of the work in question being given in a separate account particulars.

The whole balance outstanding on account of Public Works in a Division cannot be learnt from the Paymasters' journals. In the first place the advances are debited not to the Executive Officer but also to the Commanding and other Officers. 2d. These advances are mixed up with advances for other purposes. 3rd. The amount of the actual charges incurred does not appear in the Paymasters' Books.

Adjustment of advances where made.

543. The adjustment of advances on the bill for work done receiving sanction, which in the Revenue Department is effected in the Collector's journal, is in the Military Department performed in the Transfer Department of the Accountant General's office. The Paymaster who makes the advances, and occupies in this regard the same position as the Collector, has nothing to do with their adjustment. Even when, after a work has been sanctioned, a Paymaster disburses to an Engineer the difference between the advances made and the sanctioned bill, he still debits that payment like the previous advances, to the personal head of the Officer and not to the proper head of charge; and when an Engineer refunds to the Paymaster a portion of an advance received in excess of the actual cost of the work, although the receipt given by the Paymaster specifies the particular work for which the refund is made, yet in general he credits it in his journal, not to that particular work, but to the minor head of account to which that work belongs.

The Transfer Journal.

544. The Transfer journal contains no opening entries, but only adjusting and closing entries being simply a register of current transactions. When a bill sanctioned by Government has passed through the Military Auditor General's office in the mode above described and reaches the Accountant General's office, it goes into the Transfer Department; and the amount is brought into the Transfer Journal for that quarter, by an entry giving credit for the amount to the Officer or contractor who received the advance, and debiting the proper head of charge. If timber or other articles have been issued from the Government stores, their value, out of the amount of the sanctioned bill, is credited to the head "Ordnance Stores;" and the remainder only is credited to the Executive Officer.

The following are the heads of charge in the Transfer Journal

- | | |
|----------------------------------|---|
| 1. Buildings Revenue. | 7. Repairs of Judicial Buildings. |
| 2. Buildings Judicial. | 8. Repairs of General Buildings. |
| 3. Buildings General. | 9. Repairs of Ecclesiastical Buildings. |
| 4. Buildings Ecclesiastical. | 10. Repairs of Marine Buildings. |
| 5. Buildings Military. | 11. Repairs of Military Buildings. |
| 6. Repairs of Revenue Buildings. | 12. Engineers. |

In this Journal Repairs of bridges and of roads are charged to Repairs of General Buildings. The whole of the foregoing heads are closed at once to Military Books.

The Military General Journal.

545. The Military General Journal comprizes all money transactions of whatever kind in the Military Department. It is prepared from the Journals of the Paymasters, of the Commissariat, of the Ordnance Department of the Military Board, and of the Transfer Department. As regards the Public Works however it is prepared almost wholly from the Journals of the Paymasters and of the Transfer Department. Under one of the opening entries appear all balances of whatever kind outstanding against Officers, including those of advances for Public Works. The total balance against each Officer is shown, without detail of works. In the next part of the Journal the entries prepared from the Paymasters' Journals are brought in, including those relating to Public Works.

The Salaries and allowances of Officers and Establishments under the two heads "Engineers" and "General Department" above mentioned are here shown as charges; and the advances made during the year for Public Works to Engineer Officers are also exhibited. The next part of the Journal is prepared from the closing entries of the Transfer Journal. One entry shows the debits and another the credits; the transactions relating to Public Works come in here in common with others. The credits to the personal accounts of Officers thus brought in go towards the extinguishing of the balances standing against them respectively.

The following are the transfer and closing entries.

- | | |
|--------------------------------|--------------------------|
| 18. Repairs of Buildings. | 21. Profit and Loss. |
| 19. Ecclesiastical Department. | 22. Territorial Revenue. |
| 20. Dead Stock. | 23. Balance. |

In the Military General Books the following heads also appear.

- | | |
|------------------------------------|---|
| 24. Engineers. | 27. Buildings Military. |
| 25. General Department. | 28. The Honorable Company's Quick and Dead Stock. |
| 26. Repairs of Military Buildings. | |

Thus the total number of General heads for the Public Works Department is 48; viz. 34 in the Books of the Collectors and other Officers of the Civil Department, seven others in the Military Books, and seven additional in the Territorial Books. But out of this number only 23 are confined to Public Works exclusively; while in 25, other transactions are included, not at all connected with Public Works.

551. The classification of the expenditure on Public Works as here detailed, exhibits a want of clearness and precision in several important particulars. The first six general heads of charge, Nos. 2 to 8 in the list given in the foregoing para, are not confined to Public Works, but comprise a variety of charges of other kinds not at all connected with such Works. Under these general heads the charges connected with Public Works appear as minor heads, or in some cases even as mere items included under minor heads. As such they have no place in the Ledger, and there is therefore no means of ascertaining the aggregate expenditure of any year under any of these heads, except by going through all the Collectors in the Journal and abstracting the entries. Among these entries are some very important items, viz. "Repairs of Tanks and Watercourses," comprising the whole expenditure on works of Irrigation; and those of "Repairs of Roads," and "Public Roads," the two comprising together the whole expenditure on roads. In none of these three cases can the whole outlay in the year be obtained either from the Journal or the Ledger; we shall recur to these items presently.

The next General head "Civil Buildings" is confined indeed to Public Works; and the aggregate amount of expenditure in the year on new works of the classes specified is obtainable; but as the several classes, i. e. the Buildings of the several departments, which are general heads in the Collectors' Books, are minor heads in the Territorial journal, and no means are taken to bring together the whole of each class, the aggregate for the year in each Department cannot be found, except by compiling it from the several Collectorate entries. In the case of the Civil Buildings constructed or repaired by the Military Board, (at the Presidency or in the Divisions beyond the Frontier, or at certain Military Stations,) the particulars for the several Departments are shown in the same manner as for the similar works in the Collectors' journals, and the charges from both sources are incorporated together in the Territorial journal. The Head Civil Buildings is closed to "Dead Stock," and this latter is closed to "Balance," including the balance of the previous year.

552. The next five general heads (Nos. 10 to 14 in the list in Para 550) are for repairs to the buildings in the five Civil Departments. These it is to be observed are general heads, so that the total charges in the year throughout the whole Presidency in each Department may at once be ascertained. In the case of new works in the Civil Departments the general heads opened for each (except the Marine) in the Collector's journal, are closed first to the head Civil Buildings, and then to General Books, so that in the Territorial journal, Civil Buildings is the General head and the original General heads become minor heads. In the case of repairs the General heads in the Collector's journals are closed at once to General Books, and thus the original General heads come as General heads into the Territorial journal. Whether this arrangement was intentional or fortuitous we cannot tell; but the result is that a degree of importance is given to mere repairs which is not allowed to new Buildings: of the former the charges in each Department can at once be found from the journal; while as to new works this information cannot be obtained without much labour, and as to one class, viz. those of the Marine Department, it cannot be obtained at all. And while there is a General head opened for "Repairs of Marine Buildings," new buildings in that Department do not form even a minor head, but are mixed up with various other charges. In the Military Books the same course is followed, as regards the repairs of buildings belonging to the

The classification is wanting in clearness. Instances.

Civil Buildings.

Repairs of Civil Buildings are shown distinctly.

ral Treasury at Fort St. George" is closed to "Remittance of the General Department." These two heads as well as the heads "Advances on account of the Service of Government," and "Charges General of the Judicial Department," are closed to General Books.

Accounts Current would be better for these two Officers.

The transactions of these two Officers, viz. the Superintendent of Roads and the Superintendent of Public Roads, being so few and simple, it appears needless to require their accounts in the form of Journal and Ledger: the simple form of Accounts Current seems preferable. In that shape a single sheet of foolscap paper would be sufficient for the monthly or quarterly account; whereas at present the Journal requires two or three sheets of royal paper, besides some more sheets of the same description for the Ledger and the closing entries; altogether about thirty-five sheets equal to seventy sheets of foolscap.

The Territorial Journal.

549. We proceed now to speak of the Territorial Journal. The first part of that Journal, which records the position of affairs at the opening of the year, contains two main entries. Under "Sundry accounts Dr. to Balance in last Books" are entered all the balances of cash in the various Treasuries on the 1st May, as well as all Stores, Stationery, Salt &c., remaining on the same date. Under the entry "Balance in last Books Dr. to Sundry accounts" are entered the balance standing to the debit of the Government at the close of the previous books, as due to certain other parties or funds; such as Permanent Loans, Civil Fund, Education Fund, &c.

In the former entry, is found the head "Advances on account of the service of Government;" with several items, such as "Advances for the Repair of tanks and watercourses," and "advances by Collectors for different purposes," which includes Advances for Buildings and Roads, as well for various other objects not connected with Public Works.

The heads of account in it for Public Works.

550. The second part of the Journal, prepared from the closing entries of the books of the subordinate Officers, shows the receipts and disbursements of the year; the transactions connected with Public Works in the Collectories are there exhibited in common with transactions of all other kinds, those for each District being shown separately. The following are the heads under which these transactions appear. There is only one General head of advances, viz.

1. Advances on account of the service of Government.

The following are the heads under which the charges are debited.

2. Charges General of the Revenue Department.
Repairs of Tanks and Watercourses.
Engineer's Revenue.
3. Charges General of the Judicial Department.
Engineers Judicial.
4. Charges General of the Marine Department.
Marine charges, which include repairs of beacons, flagstaffs, &c. as well as Marine Establishments and other charges.
5. Charges General of the General Department.
Ordinary General Miscellaneous charges
Repair of Roads.
Engineers General.

6. General Charges Extraordinary.
Construction of boats.
Repair of do.
Public Roads.
7. Charges Military.
Repairs of Military Buildings. This however is not a separate minor head in the Territorial Journal, though it is in the Military General Books, but is mixed up with many other heads.
8. Military Books.
9. Civil Buildings.
Buildings Revenue.
Buildings Judicial.
Buildings General.
Buildings Ecclesiastical.
10. Repairs of Revenue Buildings.
11. Repairs of Judicial Buildings.
12. Repairs of General Buildings.
13. Repairs of Ecclesiastical Buildings.
14. Repairs of Marine Buildings.

The following are the heads of Refund.

15. Extra Revenue.
16. Extra General Receipts.

17. Marine Receipts.

PART I.] THEY ARE MUCH WANTING IN CLEARNESS AND ORDER. 193

555. Again the head "Repairs of Tanks and watercourses" contains all charges both for the construction, the enlargement, and the repair, of works of Irrigation; and it contains also the pay of the Collector's Maramut Establishment and the Saderward Charges of the Maramut Department. In the Territorial Journal this is a minor head to "Charges General of the Revenue Department." If therefore it is required to ascertain the whole cost of Irrigation works for a year or for a series of years, the information cannot at all be procured from the Territorial Journal; the Journals of the eighteen Districts having Irrigation works must be taken in hand, and every one of them must be searched through for the whole twelve months, to find entries under this head, and then to separate the Charges for work from those for Establishments and Saderward. It is a serious defect also that the accounts do not any where show the expenditure on new works of irrigation distinct from repairs. The Honorable Court of Directors have specially ordered that in all classes of works new constructions and repairs shall be carefully kept separate. In the case of all Buildings this is done, and partially in the case of Roads; but as regards the works of Irrigation, the most important class of all the three, the separation has never been attempted. There is no such distinction even in the Collectors' Books; and if it were required to ascertain the expenditure on new works and repairs respectively, for a year or a series of years, it could only be done by the very laborious and tedious process of examining one by one all the bills in the office of the Board of Revenue.

The charges for Irrigation works.

556. And these inconveniences which we have spoken of as likely to result from this state of the Books, are not merely suppositions, they have actually been experienced. Some years ago, the Honorable Court called for a Statement of the expenditure on roads for twenty years, viz. from 1821 to 1840. The Accountant General however represented that the preparation of such a Statement would be a work of such magnitude that his ordinary Establishment was quite unequal to it, and he obtained the sanction of Government to entertain two additional writers for that especial duty, who were occupied with it for several months. The cost thus incurred would have been quite insignificant if it had been properly necessary, but under a good system of accounts it would have been wholly unnecessary; and the loss of so much time must ever be an evil in such a case. Nor is this all: the authorities may often have occasion to know the whole expenditure on Roads or on Irrigation works; but they would not always be willing to incur the necessary expense, and in many instances the delay inseparable from the present system would make the information useless when obtained.

This inconvenience has actually been experienced.

We may add that very early in our enquiries we requested the Accountant General to supply us with a Statement of the amounts expended on the various sorts of Public Works, viz. Irrigation works, roads, and buildings, for a series of twenty years; but he replied that the compilation of such a Statement would be a more laborious task than that of even the Statement of outlay on Roads above referred to, and that it could not be undertaken in his office without extra aid. We did not think it necessary to apply to Government for such assistance; but we procured the Books from the Accountant General and caused the information to be extracted in our own office, though with much time and labour; the Statements thus compiled are given in the Appendix to our first Report. It is certain that under a good system of accounts such a Statement as we asked for could have been prepared in the Accountant General's office from the Territorial Journal by a couple of writers in half a day.

557. With reference to the head Repairs of Marine Buildings, we must observe that it is not found in any of the subordinate Books except in the Military General Books and in the Journal of the Collector of Malabar; the former referring only to the immediate neighbourhood of Madras and the latter to the District of Malabar. In many others of the Collectories there are Marine Buildings and they are repaired from time to time; but in all such cases, the charges are debited to the miscellaneous head "Marine Charges." We are unable to assign a reason for this: it appears inconsistent and irregular that where there is a head opened in the Books for certain charges, all charges of that nature wherever incurred should not be debited to it. It also leads to error, for undoubtedly in stating the cost of repairs of Marine Buildings in any year, the amount found under that head is taken in the Accountant General's office; but it is not the true amount, because it excludes the charges under that head in twelve out of the fourteen Maritime Districts.

The charges for Marine Buildings.

It appears to us to be a defect also that there is no head for "Buildings Marine," so that new Buildings belonging to the Marine Department comprising Light houses, Beacons, &c. are not shown as buildings at all, but are mixed up with a variety of other items, under the large term

several Civil Departments; and the charges are brought into the Territorial Books and there incorporated with those from the Collectors' journals. While the repairs of all buildings in the Civil Department are thus shown in detail, the repairs of Military Buildings cannot be found at all in the Territorial journal; this item is there mixed up as already said, with a great variety of others, under the General head "Charges Military." It is true that in the Military General Books the particulars can be found, but it seems desirable that the Territorial journal should be complete on all such main points without the necessity of consulting other books.

New buildings might have been so exhibited also.

553. The several heads of Repairs to Buildings in the various Civil Departments are closed in the Territorial journal under the entry "Repairs of Buildings Dr. to Sundry accounts." The object of this adjustment is stated in the entry itself, viz. it is to exhibit the total expenditure on these repairs. For this purpose all the entries of these repairs are taken from the Ledger, where they were posted under the several heads as soon as brought into the journal. By an entry immediately following the above, viz. "Sundry accounts Dr. to Repairs of Buildings," this latter head is closed, and the several Departments to which the charges appertain are debited. The following are the heads to which these debits are made.

Charges General of the Revenue Department.	Ecclesiastical Department.
Charges General of the Judicial Department.	Charges General of the Marine Department.
Charges General of the General Department.	

All these heads, which contain various other charges, are closed to Profit and Loss.

The same plan thus employed to show in one view the whole of the expenditure on Repairs, might have been adopted with the same effect in the case of new Buildings. The various heads "Buildings Revenue" "Buildings Judicial" &c. instead of being closed immediately to "Civil Buildings" in the Collector's Books, might have been closed at once to General Books. Those heads would then have come into the Territorial journal as general heads, and being closed to Civil Buildings, the whole would have been brought together; and this latter head would then have been closed to Dead Stock as at present.

The books fail to furnish some valuable information.

554. This appears to be the great defect of the existing system of accounts, viz. that, through a faulty arrangement, the books fail to afford some very important information; which by a better system would be obtainable at a glance, but which at present can only be laboriously collected, if obtainable at all, by a long and tedious search and compilation. We will mention some of the most conspicuous and important of the instances of this nature.

Instances; the charges for Roads.

The Territorial journal contains the head "Public Roads" as a Minor head under "General Charges Extraordinary." There is also a general Head "Repairs of Roads," and again another head "Repairs of Roads," a minor head under "Charges General of the General Department." The first of these Heads, viz. "Public Roads," was opened in pursuance of the orders of the Honorable Court, to contain the charges of constructing new Roads; but in point of fact only the new roads constructed under the orders of the Collectors are charged to this head. The new roads constructed by the Superintendent of Roads, and all the charges of repairing the Trunk roads under the same Officer's charge, are debited to the general head "Repairs of Roads," as well as the cost of repairing and maintaining the Government roads at the Presidency. To the 3d head, viz. "Repairs of Roads" as a minor head to "Charges General of the General Department," are debited all sums expended by the Collectors in repairing roads in the Provinces other than Trunk Roads.

Here there is a striking want of orderly arrangement, and the contents of the headings do not at all agree with their titles. It might be supposed that the head "Public Roads" would exhibit all the expenditure on the construction of roads, and the entries under "Repair of Roads," would naturally be understood to contain repairs only: but in fact a very large part of the cost of construction, which ought to have gone under the former head, is mixed up with repairs under the latter. Again it is objectionable to have a General Head and a minor head both bearing the same title, but yet meaning different things and containing different charges: and without care it might often lead to error. Nor is this at all necessary, even under the present arrangements of the Books; no reason appears why repairs of roads of all kinds should not come under the same General Head "Repairs of Roads," or why the Head "Public Roads" should not comprise new roads in all Departments.

Establishments is therefore much increased. Thus the head "Repairs of tanks and watercourses" is a minor head to "Charges General of the Revenue Department," which comprises items of a very mixed character. And this minor head "Repairs of tanks and watercourses," includes the expenditure on works of Irrigation, besides the cost of the Establishments, and the two are not separated in the closing entries of the Collector's journal. When therefore the cost of the Establishments is sought, the journals for the whole twelve months for all the eighteen Irrigation Districts must be searched; for the monthly journals alone show the charges for Establishments apart from other charges.

And even this would not give the whole charges of the Collectors' Maramut Establishments; for those Establishments in Malabar and Canara are charged to a different head altogether, viz. to Ordinary General Miscellaneous charges. Thus the same Establishments are charged in different Districts to entirely different heads; and this might often lead to mistake, and to the omission of the Maramut Establishments of the two last mentioned Districts, in compiling a Statement of those Establishments. If however it is duly remembered on such an occasion that in those Districts this head contains that charge, the items have to be collected in the same manner from the whole twelve months journals. And we must add that throughout all the Districts, temporary Establishments entertained for particular works are not charged separately, but are included in the bills for those works; this part of the charge, therefore, could only be obtained by laboriously examining the whole of the bills.

561. And it is the same with the head "Repairs of Roads." That General head comprises all work done in the Road Department, as well as the cost of a part of the Establishment. These two kinds of charges are not distinguished in the closing entry of the Superintendent's journal, and in order to enter the charges of the Establishment in the Territorial journal, they have to be sought out in the Accountant General's Office, through all the twelve monthly journals of the Superintendent. And even this does not give the whole cost of the Establishment in that Department; for the salaries of a very large part of it viz. of the Overseers, the Maistries, the Apprentices, the Lascars, and other permanent servants, are nowhere charged separately, but are distributed among the several works upon which those servants are respectively employed. This part of the cost of the Establishment therefore could only be laboriously and tediously collected from the bills. The same remarks apply to the two remaining Heads, Public Roads, and General Department.

Thus there is a most striking want of system in the mode in which the several parts of the Public Works Establishments are charged; and in almost every case the particulars could only be brought together by very tedious processes. The Statement of the Cost of Superintendence in Appendix H H of our First report was thus compiled in our own office with great labour from a multitude of papers obtained for that purpose from the Office of the Board of Revenue in the Department Public Works, the Civil Auditor, and the Military Board. The information could not be procured in any other way; and yet it was no more than would have been obtainable, under a good system of Book-keeping, by a very few hours labour.

The Establishments of the Road Department.

"Marine Charges." The construction of the Madras Light house which excluding the Light works cost 60,000 Rs. was thus charged; and that fine structure does not appear in the Dead stock accounts at all. Thus even the General head "Civil Buildings" is incomplete, and does not agree with its title, because it excludes one whole class of Civil Buildings.

The charges for the
Public Works
Establishments;

558. Another branch of the expenditure which it is very desirable to show distinctly is the cost of Establishments and Superintendence. Although this enters into the cost of every work it is essentially of a different nature from the direct and immediate expenditure on labour and materials; it ought therefore to be systematically shown separately in the accounts, and Government have often had occasion to call for the information. At present however there are no means of obtaining it in the General Books; the component parts of this charge are scattered about under various heads, and in many cases are mixed up with charges of a totally different nature.

They appear under
seven distinct
heads.

The heads to which charges for Establishments are debited in the books of the local Officers are the following.

1. Repairs of tanks and watercourses.—To this are charged in all the Collectors' Journals except Malabar and Canara, the pay of the permanent Maramut servants of their Establishments.

2. Civil Engineers.—The salaries of the Civil Engineers, their Assistants, and Establishments, are charged to this head as already said; and at the close of the year the whole entries under it are divided among the three heads Engineers Revenue, Engineers Judicial, and Engineers General.

3. Ordinary General Miscellaneous Charges.—To this head the Collectors' Maramut Establishments are debited in the Districts of Malabar and Canara only; because in those Districts there are no works of Irrigation.

4. Public Roads.—This head in the Collectors' Journals includes the salaries of Officers and Establishments, superintending the construction of roads or Passes under the Collectors.

5. Repairs of Roads.—To this head in the Journal of the Superintendent of Roads, are charged the salaries of himself and his assistants and of a part of his Establishment; and in that of the Sub Treasurer, the Pay of the Establishment of the Superintendent of Public Roads. The same head comes into the Territorial Journal as a General head. A considerable part of the Establishment of the Road Department is not charged separately at all, but is included in the Bills for individual works.

6. Engineers.—This head occurs in the Military Books only. It is that to which are debited the greater part of the salaries of Executive and other Engineers and Officers engaged on Public Works and their Establishments.

7. General Department.—To this head in the Military Books are debited certain portions of the salaries of certain Officers of the Public Works Department.

Of which only two
are combined to
each charge.

559. Of the foregoing seven heads, there are only two which do not comprise other charges besides those for Establishments. Those two are "Civil Engineers" and "Engineers." The three heads into which the charges under the former of these are distributed, viz. Engineers Revenue, Engineers Judicial, and Engineers General, are brought into the Territorial Journal as minor heads to the General Heads Charges General of the Revenue, of the Judicial, and of the General Departments, respectively. Being minor heads they do not appear in the Ledger, nor are they brought together in any adjusting or closing entries. When, therefore, it is required to find the cost of the Engineers and their Establishments for any year, it is necessary to search out and extract from the Territorial Journal, the entries under each of the three heads above specified, in each of the nine Collectorate in which the charges of the Civil Engineers and their Establishments are debited.

The head Engineers does not appear in the Territorial Journal at all, all the charges for Public Works in the Military Department being there merged in the General Head "Charges Military." In the Military Books the head "Engineers" is a General head and gives the charges separate and distinct. The head "General Department" does not appear in the Territorial Books, but only in the Military Books. It includes a great variety of other items in no way connected with Public Works Establishments, or Public Works at all. If the Charges on account of Establishments under this head are required, the whole of the Paymasters' Journals, in which that head occurs must be examined, and the amount be thus brought together.

The Collectors
Maramut Estab-
lishments.

560. All the other five heads are minor heads to General heads in the Territorial Journal, which include besides, charges of other kinds; and the difficulty of discovering the charges for Estab-

regard, for among their various functions they possess those of Receivers General of the Revenue and Paymasters General, in both which capacities they belong to the Finance Department. The case of the Superintendent of Roads also is not exactly similar, because as that officer himself is accountable for the money advanced to the Department, he is not in the same independent position of control which the Board of Works will occupy. But the Commissariat and the Ordnance are precisely parallel cases; they are entirely distinct branches of the administration; and they are under controlling heads not at all personally concerned in the receipt or disbursement of money. Now the accounts of the Commissariat Department, amounting to thirty lacks yearly are kept by the Commissary General; and those of the Ordnance, amounting to twenty three lacks yearly, are kept by the Military Board as controlling head of the Ordnance Department. And the Books of both Departments are submitted to the Accountant General at the close of each year, to be examined and incorporated in the general books.

565. This is precisely the course of proceeding which we propose for the Department of Public Works, with this difference, that the books shall be made up and rendered to the Accountant General monthly instead of annually. It would be superfluous to remark how much this will increase the means of a prompt and efficient examination, if only those means are duly made use of. It is true that the accounts of the Collectors and of the Superintendent of Roads though now rendered monthly, receive but little attention till the close of the year; but even though that practice should be continued in the case of the books of the Public Works Department, we would still strongly urge that at least they should be prepared and transmitted monthly, on account of the great advantages of promptitude and punctuality within the Department itself. And with the materials and machinery provided by our system, this will be done without any difficulty. The monthly accounts received by the Board will supply all the necessary particulars; and the transactions being so simple, and the heads of charge so few, the preparation of the Journal will be extremely easy, and will need little more than care that the bills are debited to the proper Departments and heads of Account. We shall presently detail more fully the proposed mode of keeping the books and classifying the charges.

566. There is a further change in the present system, which appears to us to be very desirable; though the proposal will probably be thought strange and startling at first, simply because it is contrary to the existing practice. Charges of all other kinds are for the most part debited without delay as soon as they are incurred; subject to final audit, and to retrenchment where occasion may be found. In the Public Works Department, and in that almost alone, it is the practice to admit no charges till they have been finally passed. We are not aware what was the reason for making this distinction, but we are of opinion that it ought to be abolished. The whole charges of the Government Establishments in all Departments, and in this of Public Works among the rest, including variable allowances such as travelling allowances, extra tentage, and batta to Native Servants, are debited at once as soon as incurred; as are also pensions of all kinds, and the cost of extra Establishments. Again, subsistence to Prisoners, the cost of rice and other supplies for the Jail, rewards for apprehending malefactors, and for killing wild beasts, and a variety of other charges which vary materially in amount from year to year, and of which the actual amount in each year needs the subsequent sanction of Government; all those payments are debited in the accounts immediately they are disbursed. And it is the same also with another class of charges still more nearly resembling those for Public Works. There are a variety of expenditures incurred in the Civil Departments on estimate, such as for belts and badges for peons, for office furniture, &c.; and in their case also as soon as the charge is incurred, and the exact amount ascertained, it is immediately debited in the accounts.

567. And in the Military Department also we find the same system. The whole charges of the Pay and allowances of the Army, including all Pensions, and amounting to about two hundred lacks a year, is brought to account immediately on disbursement, and is journalized in the office of the Accountant General without any reference to the audit, which takes place in the office of the Military Auditor General. Many variable allowances are included in the above sweeping term; travelling allowances &c. So also those charges termed Miscellaneous, comprising many items contingent as to occurrence and uncertain as to amount, are similarly audited after being charged in the accounts; and the audits are as strict, and the recoveries of retrenchments as certain and inevitable, as they could be under any system whatever. The principal exception to

The same course
should be fol-
lowed in this
Department.

The books will be
compiled with-
out difficulty.

The charges should
be debited as
soon as the bills
are made out.
The practice in the
Civil Department.

In the Military De-
partment.

PART II.—CHANGES PROPOSED IN THE PRESENT SYSTEM OF KEEPING THE ACCOUNTS.

The objects to be effected.

562. Having thus described the present system of keeping the Accounts of the Public Works expenditure, and noticed some defects in it, we go on to set forth the changes which we propose. These will involve a revision of the heads of charge, and the substitution of such a system as will keep the charges for Public Works entirely distinct from other charges, will simplify and systematize their arrangement, will show them all together in one view, and will exhibit distinctly all the various branches of those charges, both for the whole Presidency and for each District or Division.

The Board of Public Works to keep the books of the Department.

In the first place, it appears to us to be highly desirable, and indeed essential to a good system, that the books of the Department of Public Works should be kept by the controlling Board. Upon that Board will devolve the task of auditing the bills for work done; and likewise, under our recommendation above made, of finally passing them in the great majority of cases. And we think it will properly be their duty to record in due classification all the charges incurred for Public Works; in other words to keep a set of books in regular form. No other office is in a condition to do this so well as the Board, who will have the control of the Department, and who will necessarily have for the purposes of that control, very much of the knowledge and information, required for keeping the books. It seems indeed too obvious to need argument, that just as the Collectors, the Military Paymasters, and the Sub-Treasurer, keep the accounts of their own transactions, and just as the Commissary General keeps a set of books for the charges of that Department, the Military Board for those of the Ordnance Department, and the Superintendent of Roads, the Superintendent of Government Roads, and the Superintendent of Stationery, for their respective Departments; so the controlling head of the Public Works Department should keep the accounts of that Department, should record all its transactions in regular order and in systematic arrangement. And, we must repeat, no other office will be or can be in a position to do it so well, so certainly, and with so little inconvenience to the Subordinate and working grades of the Department, whose operations supply the materials for the accounts. We may add that this systematic record will be necessary, to complete the information of the Board as to the operations of the Department.

This course affords the best means of supervision and check.

563. And it must not be supposed that this proposition involves any relaxation of scrutiny into the accounts, or withdraws them from the control or inspection of the Accountant General. Our plan is that the Board's Journal and Ledger shall be compiled monthly, from the accounts current of the District Engineers and other Executive officers, and shall then be sent to the Accountant General's Office, to be there subjected to examination, and eventually be incorporated into the General Books. This course we submit is more in accordance with correct principles than the present system. The province of the Accountant General, as it appears to us, is not to keep the books of particular Departments; but to receive them from the heads of those Departments respectively, and after examination, to enter the results in their proper place in the general Books of the Government. And it seems self-evident that this is the course most likely to ensure accuracy and punctuality in the accounts. Under such a system the accounts are made up in one office, and are then subjected to the scrutiny of an independent Department fully competent to the task and close at hand; and if such supervising office does its duty neither errors nor delays on the part of the Departmental office can pass unnoticed. But where it is the supreme and ultimate office of account, which compiles the books, this great advantage is lost. There is no effective after examination, for the inspection at the India House, without full information, and too distant to procure explanation, cannot be so considered; and hence carelessness, irregularity, and the absence of any tendency to improvement, are likely to be induced.

Examples already existing of the course here advocated.

564. And we may appeal once more to examples already existing, in exact analogy to the course which we now advocate. It may be objected to the instances of the Collectors, Military Paymasters, and Sub-Treasurer, that they are not strictly in point, inasmuch as those officers are not heads of separate Departments but are the direct subordinates of the Accountant General. The Sub-Treasurer and the Military Paymasters obviously so; and the Collectors also in this

PART II.]

THE CLASSIFICATION OF THE CHARGES.

203

we think it will be sufficient to show merely the total amount of the repairs to each class of works, and in the case of buildings, to those in each Department.*

575. The Journal for the month having been thus prepared, the entries will be posted into the Ledger, as in Appendix P. The Ledger will be an abstract of the Journal, and will show clearly the debits and credits under each head. For example, if it is desired to ascertain the balance standing against any officer, it will be found instantaneously on turning to the Ledger. It will not be necessary therefore to keep any subsidiary book for the purpose of showing those balances, such as is kept now in the Accountant General's Office under the name of the "Individual book."

It may be mentioned that the Board's Journal for April, being the concluding month of the official year, will be compiled from the Accounts Current of the various Executive officers for the same month, which will contain the charges on all works in progress, of whatever nature, up to the end of the official year, so far as not previously rendered. Every District and Executive Engineer should call in the accounts of all works in progress to the end of the official year, and obtain and submit bills for them as speedily as possible. We have already explained how easily under the new system of accounts this periodical closing will be effected. As the Accounts Current for that month will thus be fuller than those for other months, their transmission will be somewhat delayed, and the compilation of the Board's Journal therefore for that month may consequently be somewhat retarded also. This delay however need not be great; and it is unimportant compared with the essential point that the Books of each year shall comprise the whole of the charges of that year, and shall contain no others whatever.

After the Journal for the last month of the year has been completed, and the entries for that month duly posted into the Ledger, the closing entries will be prepared. The arrangement of the heads and the mode of closing them will be detailed presently.

These Books of the Board of Public Works will be the authentic record of the transactions of the Department and will be the source from which all information sought will be obtained. No subsidiary books or statements need be kept, for all facts wanted will be here recorded in orderly arrangement and classification.

576. We will now briefly detail the heads which in accordance with the plan just described we propose shall be opened in the Journal of the Board of Public Works. The classification and nomenclature to be adopted, or in other words the heads to be opened in the accounts, should be determined after careful consideration; and having been determined they should be strictly enforced throughout the Department. And no change should be made in the authorized arrangement without very strong reasons, because all such changes tend to vitiate the comparisons between different years.

Advances will be debited as already said, to the officer receiving, by his official title; and every such officer will have a separate Head of account in the Board's Books. These heads will be closed at the end of the year to "Balance," to show the balance outstanding against each officer.

The heads of charge to which the advances will be transferred after the bills are received will be the following.

1. Irrigation Works
2. Roads and Bridges.
3. Rail roads.
4. Canals.
5. River Navigation.
6. Ports and Harbours.
7. Ferry Boats.
8. Buildings Revenue.
9. Buildings Judicial.
10. Buildings General.
11. Buildings Military.
12. Building Ecclesiastical.
13. Buildings Marine.

All new works alterations and extensions to come under some one of these heads as the case may be.

* The existing rules require that repairs to Military Buildings should be given separately for each Station, though new Buildings are shown only in one sum for each Division. If it is thought necessary to continue this practice it will only be necessary, and it will be very easy, to enter separately in the Boards' Journal the repairs to Military Buildings at every Station.

The Ledger.

The Journal for April how to be prepared.

The closing entries.

Enumeration of the Heads of account proposed to be used.

this practice is that all vouchers received in the Transfer Department of the Accountant General's Office, are passed by the Military Auditor General before being brought into the accounts. The Transfer Department was formed in 1816 for the record and adjustment of payments made in other Presidencies and Countries to Officers belonging to this Presidency; all the vouchers for such payments being sent direct to the Accountant General. After being received there, the vouchers are first sent for examination to the Military Auditor General, and the charges are not entered in the accounts till they have been finally audited. The charges for that portion of the Public Works which are under the control of the Military Board, are adjusted in the Transfer Department, as already noticed, and of course are treated in the same manner. There are a few other instances in which particular species of payments are required, either by special orders or by practice, to be passed by the Military Auditor General some before being paid, and others before being entered in the accounts. We had a long conversation on this point with Mr. Mahony the very intelligent and experienced Uncovenanted Assistant to the Military Auditor General. He declared that he could not say why these exceptions were made; but that the greater part of them appeared to him to stand on no good ground of reason, but merely to have been allowed to continue because they existed. With respect to the practice in the Transfer Department he could see no reason why the same course should not be followed as with the Paymaster, viz. why the charges should not be journalized immediately, and the vouchers sent afterwards to the Military Audit office for examination. As to the charges for Public Works, he declared himself unable to see why those charges should be brought into the Transfer Department at all; and he thought that they might safely be charged in the Paymasters' Journals and come up with the vouchers for audit like other charges.

In the Ordnance and Commissariat.

568. Thus in the Military Department also the vast bulk of the charges are audited after they have been brought into the accounts and journalized. And it is the same with the charges of the Ordnance, another large branch of the Government expenditure. The Ordnance Department is under the entire control of the Military Board, who both keep the accounts, as already said, and audit the charges, the Journal is compiled monthly, from the returns of the local officers, and the accounts are audited subsequently. The Ordnance charges are twenty three lacs yearly. Those of the Commissariat are thirty lacs; and in that Department also the same course is followed. The Commissary General makes up his books at the end of the year, and sends them to the Accountant General by whom the charges there found are incorporated with the general charges; the audit of the accounts takes place monthly partly in the Military Auditor General's Office, and partly in that of the Military Board.

The same practice should be adopted in the Public Works Department.

569. We fail to see why a practice so universal in the other Departments, and which works so well there, should be inapplicable to that of the Public Works. Whatever guarantees exist in those other Departments would be found in that also; and independently of that comparison, and viewed intrinsically, they would certainly be valid and sufficient. The audit would be as certain then as it is now, and would be just as effectually enforced. And in point of fact the corrections or retrenchments on audit in all the three Departments are utterly insignificant, as already noticed in paras 386, 384 and 393. Yet for the sake of these utterly insignificant corrections, if indeed for any deliberate reason at all and not by mere accident, the serious practical evil of accounts always largely in arrear is systematically endured; although in point of fact, as is proved by actual experience in other Departments, the corrections would be made just as certainly under the opposite practice.

On the other hand, in favour of the course which we advocate it is to be stated that it would not only be in harmony with the practice of the other Departments, but that it is absolutely required by that standing rule of accountancy that all transactions shall be recorded just as they occur in chronological order; and that after corrections shall be shown not by deduction but by opposition; viz. by an entry on the opposite side of the account. Another advantage will be that it will get rid of the large outstanding balances, now always borne on the books in this Department, and which are inevitable under the present system.

On the foregoing considerations we strongly urge the adoption of the change proposed in the mode of making up the books of the Public Works expenditure, as greatly promoting simplicity, punctuality, and exactness, in the accounts, and as in no degree weakening any of the guarantees for their truthfulness.

570. We must add however that the course which we are advocating as to the charges, ought to be associated with a rapid auditing of the bills; and this also our system ensures. With the clear and simple accounts which we have described, the bills will be prepared without difficulty or delay immediately on the completion of the work; and if there should be any tardiness, it will be immediately apparent to the Board in the monthly accounts. And the audit will be equally expeditious; the bills will be coming in continually, and will be taken up for audit in the order of arrival. And though, from the fact that many more bills, and to a much larger amount, will be received at some seasons of the year than at others, the audit will not be at all times equally near in time to the receipt of the bills; yet there seems no doubt that by good arrangements it may be kept from ever falling more than three months behind it, and that during the slack season the interval will not exceed one month. In order to ensure due attention on the part of the Board to this important duty, it seems desirable that they should be required to lay before Government punctually at the commencement of every month, a statement showing the state of their audit. This paper should specify the number and amount of bills remaining at the beginning of the preceding month, of those received and of those audited during the month, and of those remaining; the date of receipt of the bill longest on hand should also be given.

The audit would follow with rapidity.

A further valuable check will be obtained by requiring that on the completion of the auditing of all the bills for every year, which under the new and correct system of accounts will comprise all the expenditure on works in that year, the Board should submit a statement to Government showing the number and amount of the bills received, the number and amount of objections made on audit, and the number and amount of those sustained, i. e. of retrenchments made. Such a document will enable the Government to judge both as to the activity of the audit, and how far objections were made without due cause. To complete the information, a memo may be added of the number and amount of the retrenchments of the previous year, reversed on appeal by the Government: this information could not be given for the same year as the rest, without too long delaying the submission of the whole.

571. As to the means of compiling the books, we have already spoken of them, and will only briefly notice them here. The District Engineers and Executive Officers will severally send in monthly Accounts Current to the Board of Public Works; which will show the advances received during the month, and the amounts of the bills made up and taken credit for during the same period, either for completed works, or periodical bills for parts of works. The advances also will be verified by information received independently from the Collector through the Inspecting Engineer, as provided above in para 490. As vouchers for the charges also the bills themselves will be before the Board. They will go to the Inspecting Engineer as above provided, for examination and transmission to the Board; and they will therefore not accompany the Account Current. As fast as the bills are examined and passed by the District Engineer, they will be entered in his Account Current and be despatched without delay to the Inspecting Engineer. The examination by the latter officer will not take more than a few days in each case, and at the close of each month he will send on to the Board of Works all those received during the month, as vouchers for the District Engineer's Accounts. From the foregoing materials the Board's Journal for the month will be made up immediately, as just recommended, leaving the bills to be finally audited afterwards, according to the almost universal practice in the other Departments. In accordance with this recommendation we proposed in our last Section in describing the monthly Accounts Current, that the Engineer officer should take credit for the amount of such bills as he has examined and despatched in the course of the month, and not (according to the present practice) for those which have been submitted and sanctioned. The Board's Journal will be compiled with very little difficulty, because the heads will be so few and simple.

The materials for the compilation of the Board's Journal.

572. In order to remove the defects above noticed in the present composition of the accounts of the Department, and to make them the means of supplying all the information wanted, we propose the following arrangements. First, as to the advances; these to be debited by the Collector, Military Paymaster, or other disbursing officer, to the District Engineer by his official designation, simply as advances for the execution of Public Works, and without any reference to the particular services for which issued. The disbursing officer will close all debits of this class to the Head "Board of Public Works;" under this head they will all come into the books of the Accountant General, and he will be enabled to exercise a general control over their adjustment. The

The classification of the charges.

officers receiving the advances on the other hand will enter the advances in their Accounts Current, from which they will be transferred to the monthly Journal of the Board of Public Works as debits against the officers; till removed from time to time, on bills for works performed received from the officer, by crediting him with the amount, and debiting it to the proper head of charge.

As respects the charges, the following is the classification proposed. The main division will be threefold, viz. in to Irrigation works, Communications, and Buildings. And the second and third of these three divisions will be further subdivided; Communications into Roads and Bridges, Railroads, Canals, River Navigation, Ports and Harbours, and Ferry boats; and Buildings, into Civil and Military; and the former into Revenue, Judicial, General, Ecclesiastical and Marine. Each one of all these subdivisions will further be distinguished into New Works, including alterations and improvements; and Repairs, including maintenance, and the minor improvements necessary thereto, as recommended in our First Section, paras 32 and 43. The amount of the expenditure under the former of these two main divisions to be added to Dead Stock, because producing a permanent value; that of the latter to be charged to the current expenses of the several Departments, as will be more fully detailed presently.

573. With the view of explaining the proposed arrangement of the charges more clearly, we have caused a Journal and Ledger to be prepared and filled up for a few Districts with fictitious amounts, so as to show all the heads of charge, and the proposed mode of closing all of them. Those specimen books will be found in Appendices O and P; and we will here offer a few remarks on them. Appendix O is the Journal. It is called the Journal for the year, in order to show the opening and closing entries; but it contains the current transactions of one month only, that being sufficient to exemplify the proposed method of classifying and recording the charges; while to have completed the book for the whole twelve months, would not only have been a work of much time and toil, but would have made the book inconveniently large.

The opening entries for the year are three in number. The first, "Sundry Accounts Dr. to Balance," shows the Balance brought forward from the previous year's books. It exhibits the value of the "Dead Stock" including stores and tools, and the balance of cash to be accounted for by the several Engineer Officers who have received advances for the performance of work. The next entry, "Balance Dr. to General Books," is only a transfer entry, for the purpose of transferring the balance shown in the first entry to the General Books. The third entry "Sundry Accounts Dr. to Dead Stock" is to show the particulars of Dead Stock under each head, in order that the additions made in the course of the current year may be incorporated with it. The foregoing being the opening entries of the year will appear only in the Journal for May, the first month of the official year.

574. After these follow the transactions of the month, as taken from the Accounts Current of the various Engineer Officers. The first two entries relate to the advances. Under the entry "Public Works Department Dr. to Sundry accounts" all the Collectors and other officers who have made advances during the month to Engineers receive credit; and in the following entry all the Engineer Officers who received those advances are debited with the sums so respectively received by them, for which they are accountable.

Then follow the charges of the month. The two entries "Public Works Department Dr. to Sundry accounts," and "Sundry accounts Dr. to Public Works Department," both show the amount of charges for work done according to the bills received by the Board, and the Accounts Current of the District and Executive Engineers. Under the former of the two entries those officers receive credit respectively for the amounts of the bills thus rendered, in diminution of the advances standing against them. In the latter entry the amounts are debited to the proper heads of charge. The form of Journal in the Appendix being designed simply to show the proposed mode of arranging and classifying the charges, only the names of the Districts are given; without any details of particular works, which would inconveniently increase the bulk of the document. In the real Journal however, the details of the works performed in each District or Division should be here given. As respects all works coming under the term "New Works," each one should be separately named; the nature of the work and the date of the sanction of Government to the estimate should be specified. With regard to repairs, it does not appear to us necessary to give that detail;

This will be a real examination, and it will be the fault of the Government if it is allowed to degenerate into a mere form. It will complete the control which the Government will exercise over the operations of the Public Works Department and render it effective for all the purposes of economy and good Government.

584. This annual view of the expenditure, and annual comparison between the grants and the actual disbursements, essential as it is to an effective control over the expenditure, will be entirely new in this Presidency. At present the Government have neither a connected statement prospectively of the grants made, nor retrospectively of the amounts actually expended. And under the existing system of accounts the latter statement at least, and the comparison, must be impossible; because as already said, there can be no real comparison unless the things compared are the same, unless the expenditures on any particular works and in any particular year, are compared with the grants for the very same works and the same year. At present, indeed, yearly Statements of the expenditure are drawn up, both in the Revenue and in the Military Department. The former is prepared by the Board of Revenue and submitted to Government. For the latter lists of Bills passed are sent quarterly by the Military Board to the Military Auditor General; and from these lists, checked by the Bill Book of his own office, that officer prepares an abstract statement which is entered in his annual Statement of Military charges. But in neither case does the statement represent the actual expenditure of the year. Till the present year both were compiled from the bills sanctioned during the year, which represent expenditure incurred long before; this is still the practice in the Military Department, but in the Revenue it is now attempted to show the expenditure incurred in the year, but approximately only.

585. The statements heretofore submitted by the Board of Revenue were thus described in a memo. by the Secretary sent up to Government with the Board's letter of the 9th March 1846; "Independently of the want of classification under the present mode of reporting the annual expenditure, and of the admission therein of extraneous charges, the actual expenditure of any year has never yet been accurately or even approximately stated, the reports having included only the expenditure actually sanctioned by Government" (i. e. the amount of bills so sanctioned) "during the year, and by no means the whole even of that." The actual execution of the works included in the statements of both Departments for any given year was not only very probably completed one or even two years before, (See Part IV of Section V as to the delays in passing bills,) but may have been spread over two or more years even before that. Thus in the case of the Godavery Anicut, bills to the amount of nine and a quarter lacks of Rupees for that work were finally passed in April 1853, and under the above system that amount would be set down as a part of the expenditure of the year; though the outlay was in fact spread over the years 1847 to 1851, and no part of it really took place in 1853. Again a bill for the Perumbaddy Ghaut to the amount of Rupees 1,74,895 was sanctioned by Government in July 1852, and would appear as a part of the expenditure of that year, though in fact wholly disbursed in the years 1848 to 1851.

586. But a change has now been made, as already said, in the mode of preparing the statements of the Revenue Department. In December 1845 the Government noticed the fact that those statements did not exhibit the real expenditure of the period ostensibly referred to, and directed the Board to prepare them for the future in such a form as to show the actual disbursements of each year. To those who have read our review of the Talook accounts in Section III of this Report, it will be hardly necessary to say that to conform to this order was impracticable without an entire reform of those accounts. The Board however resolved not to interfere with the existing system of the accounts, but recommended to Government a plan under which they anticipated that the actual expenditure of each year would be stated approximately though not accurately.* It is unnecessary to detail that plan; it is sufficient to say that the Board's statement was to be prepared for some classes of works from Progress Reports, which rarely represent the real expenditure, and for other classes by taking the amount of the estimates as the actual outlay. Compiled from such sources the statements would necessarily be only approximations to the real facts, though certainly more near the truth, as to the actual expenditure of the year referred to, than if based on the bills sanctioned during the year. Until the present year, however, the Board were wholly unable to fulfil their intention as to the change in the mode of preparing their

* See memo. by the Board's Secretary in this Department, submitted to Government with their letter of the 9th March 1846.

At present there is no such review and comparison.

The Statements now submitted are not prepared on a right basis.

New mode of preparing the statements in the Revenue Department.

14. Repairs of Irrigation Works.....
15. Repairs of Roads and Bridges.....
16. Repairs of Railroads.....
17. Repairs of Canals.....
18. Repairs of Ports and Harbours.....
19. Repairs of River Navigation.....
20. Repairs of Ferry Boats.....
21. Repairs of Revenue Buildings.....
22. Repairs of Judicial Buildings.....
23. Repairs of General Buildings.....
24. Repairs of Military Buildings.....
25. Repairs of Ecclesiastical Buildings.....
26. Repairs of Marine Buildings.....
27. Stores of Public Works Department. The purchase of tools and implements will be debited to this head.
28. Miscellaneous charges on account of Public Works. Contingent charges, and other Miscellaneous charges of this Department will be debited to this head.

All repairs to come under this head.

The Heads for the Transfer and closing Entries.

577. The Transfer entries will be as follows.

- | | |
|---|--|
| Repairs of Irrigation Works..... | } To be closed to "Charges General of the Revenue Department." |
| Repairs of Roads and Bridges..... | |
| Repairs of Ferry Boats..... | } To "Repairs of Communications." |
| Repairs of Rail Roads..... | |
| Repairs of Canals..... | |
| Repairs of Ports and Harbours..... | |
| Repairs of River Navigation..... | } To "Repairs of Buildings." |
| Repairs of Revenue Buildings..... | |
| Repairs of Judicial Buildings..... | |
| Repairs of General Buildings..... | |
| Repairs of Ecclesiastical Buildings..... | } To "Charges General of the General Department." |
| Repairs of Marine Buildings..... | |
| Repairs of Military Buildings..... | } To "Civil Buildings." |
| Miscellaneous charges on account of Public Works..... | |
| Buildings Revenue..... | } Will at once be closed to "Dead Stock." |
| Buildings Judicial..... | |
| Buildings General..... | |
| Buildings Ecclesiastical..... | |
| Buildings Marine..... | } To "Communications." |
| Works of Irrigation..... | |
| Buildings Military..... | |
| Stores of Public Works Department..... | |
| Roads and Bridges..... | } To "Communications." |
| Ferry Boats..... | |
| Rail Roads..... | |
| Canals..... | |
| Ports and Harbours..... | |
| River Navigation..... | |

The head "Repairs of Communications" will be closed to "Charges General of the General Department." The head "Repairs of Buildings" will be transferred to the following heads.

Charges General of the Revenue Department.	Charges General of the Marine Department.
Charges General of the Judicial Department.	Ecclesiastical Department.
Charges General of the General Department.	Charges Military.

The head "Communications" will be closed to "Dead Stock;" with the exception of the charge under "Ferry Boats," which will be transferred to "Charges General of the General Department," the ferry boats not being of a sufficiently permanent character to be entered in the Dead Stock.

The head "Civil Buildings" will be closed to "Dead Stock;" and this latter head will be closed to "Balance," thus making the whole of the transactions clear and complete.

578. The system above detailed appears to us to unite simplicity and brevity with clearness of arrangement and with full and efficient control. As respects the advances, it dispenses with a vast mass of useless correspondence in the Military Department; applications to the Military Board for advances, instructions to receive them, notice to the Accountant General that such orders have been given, instructions to Paymasters to make advances, instructions how to debit and how to adjust balances; instructions to Engineer officers to take credit for bills sanctioned; to amend their Accounts Current, or information that they are found correct. All this will be swept away, and in its place a simple system of brief accounts, punctually rendered, affords all the check thus so cumbrously attempted. In the Civil Department the same simple system provides the same effective control, where now there is none.

All advances by whomsoever made and to whomsoever, will be debited in the Public Accounts to the Board of Public Works and it will become the Board's duty to debit the actual charges to the proper heads. And those heads as above detailed will show the charges under a natural and convenient classification, and information as to the expenditure under each head will be readily obtained. The Board will be able to charge all expenditure to the proper Departments and Governments. For example, expenditure on the Civil Works in the Saugor Division will be closed to the North West Provinces; that in Mysore to that Territory, that in the Tenasserim Provinces or in Coorg to the Bengal Presidency; and the Accountant General will gather up all these entries and show them in their proper position in the General Books.

579. And all this will be subject to effective control by the Accountant General, for which the means will be furnished in the Monthly Journals of the Board sent to him every month. He will compare the advances credited in the Board's books with those debited in the Journals of the Collectors, Paymasters, and others; and he will notice any unusually large balance outstanding against any officer. In short there will be a double check, the Board and the Inspecting Engineer in one Department, and the Accountant General and the Collector in the other, to see to the correctness of the amounts advanced and debited as advanced. The former authorities being responsible to Government for the correctness of the details, the latter for the total amounts.

Again, as to the charges; as respects all new works, the Accountant General will be able to see that the charges are debited to the proper heads. The items in the journal containing them will both briefly describe the work, and quote the sanction of Government; and as we have recommended that these sanctions shall be communicated to all the officers concerned by means of a notification in the Gazette, they will be in the hands of the Accountant General. As respects mere repairs, it does not appear expedient to encumber the journal with the individual details of works of that class; and it seems to us that it may safely be left to the Board to debit correctly charges of so simple a nature.

The duties of all the officers of the Department will be greatly simplified and facilitated by making them subordinate to one authority, and releasing them from their position of responsibility to several authorities in different Departments. And in particular by the great simplification and abridgment of the accounts to be rendered by the Executive Engineers, their attention will be set free to be given to their proper duties.

580. After the charges of the year have been duly arranged and recorded, it will remain to bring them under a systematic review. The basis of this review will be the budget for the year and with this will be compared the actual disbursements of the year under the same arrangement. And the actual disbursements thus compared must be those out of the very same sanctions, and on the very same works as were shown in the budget. Unless this is done it is obvious that there can be no detailed comparison with any previous budget; and again unless the expenditure taken is the bona fide disbursement of the period ostensibly comprised in the statement, there cannot be any certainty or accuracy in the comparison of one year's so-called expenditure with that of another. Now the simple and straightforward Executive Accounts which are the basis of all the books and

The system of Account is simple and clear.

And the Books will be under effective control by the Accountant General.

A Balance sheet should be prepared annually.

accounts in our system, afford infallible means of determining the actual expenditures on any work at any time; and consequently of determining with absolute precision, and this instantaneously and without any delay, the actual expenditure on every one of the works in progress throughout all the Districts and Divisions of the Presidency, up to the close of the official year; and it is these actual charges of the year only, that will be admitted into the books of the year.

How to be composed.

581. From these books then the Board will frame a statement or balance sheet, in the same classification as the budget, showing the excess or deficiency of expenditure in each item and in each of the Districts and Divisions, in comparison with the sum allowed in the budget; and this document will annually come under the review of Government, in the mode to be detailed below. By this means the Government will have what they have never yet had, a connected view beforehand, in the budget, of the expenditures to be undertaken in each year; and a similar view afterwards of those actually incurred on the same objects, together with a comparison between the two. This balance sheet may be made more or less minute and detailed as may be thought necessary. But we think that it will be sufficient for all practical purposes if it compares the grant and the expenditure in the case of every separate Government sanction. It will then show separately the grant and the expenditure for each individual new work sanctioned by Government of whatever kind; but as respects Repairs to buildings, Civil and Military respectively, Repairs to works of Irrigation, grants for the maintenance of made roads, and for the repair and improvement of the unmade roads, it will show only the total amount granted on each of those accounts in each District and Division, and the total expenditure, without enumeration or detail of the particular works undertaken. But all that detail also will be in the possession of the Board of Works, in case the Government shall see fit to call for it on any particular occasion.

The scrutiny of this Balance sheet.

582. In connection with this balance sheet, we propose that an important duty shall devolve on the Accountant General. The due audit of expenditure in every department consists of two parts; First, the detailed audit, the object of which is to test the various charges of the disbursing officers, and to allow or disallow them according as they are or are not in accordance with departmental rules, or are or are not supported by proper vouchers; second, a higher and more general audit designed to ascertain whether the funds granted have been expended on the objects for which they were assigned. The former of these two species of audit belongs to the controlling Head of the Department; and in the case before us will properly be performed by the Board of Public Works as already provided; indeed it is clear to us as above said that no other authority can be in a position to perform this part of the audit so effectually. As respects the second part of the audit, the more general scrutiny into the correctness of the charges, hitherto there has been nothing of the kind under this Government, and indeed in the absence of any connected view either of the intended or of the actual expenditure, such an audit was impracticable. Having now provided for such connected and comprehensive statements of the expenditure both future and past, this comparison of them becomes possible, and is highly expedient, as completing the control of the disbursements.

The Accountant General to scrutinize and report upon it.

583. And it appears to us that the duty of making this comparison ought to be laid on the Accountant General. The Government are not in a position to make it themselves; and even if they were considered to have the necessary ability, knowledge and leisure, still it would be proper that they should bear as it were both sides, and should then decide, rather than that they should have the statement of one party only, and then exercise their own ingenuity to see what could be advanced against it. In short if the kind of scrutiny in question is to be exercised at all, it must be by some authority apart from the Government; if left to the latter it would not be performed in reality, but would become a mere form, like the examination of the Bills of the Road Department. And except the Accountant General there is no authority on whom the duty could properly be placed. It is strictly one of account, and from its importance and magnitude ought to be in the hands of the highest authority in the Account Department. We propose then that the Balance sheet made up as above stated should be sent by the Board of Public Works to the Accountant General, with explanation of all the instances in which the expenditure shall have exceeded the sanction, and that the Accountant General shall report thereon to Government pointing out the more considerable variations between the estimate and the expenditure, and stating the causes assigned. On this Report considered in connection with the reasons given by the Board of Public Works, and with their annual report, the Government will issue such orders as may seem proper.

546. The following are the heads of charge for Public Works in the Military General Journal. The heads of charge enumerated.

- | | |
|------------------------------|--|
| 1. Engineers. | 8. Repairs of Revenue Buildings. |
| 2. General Department. | 9. Repairs of Judicial Buildings. |
| 3. Buildings Revenue. | 10. Repairs of General Buildings. |
| 4. Buildings Judicial. | 11. Repairs of Ecclesiastical Buildings. |
| 5. Buildings General. | 12. Repairs of Marine Buildings. |
| 6. Buildings Ecclesiastical. | 13. Repairs of Military Buildings. |
| 7. Buildings Military. | 14. Repairs of Roads. |

It will be seen that the two heads "General Department" and "Repairs of Roads" appear here in addition to those found in the Transfer Journal. Of these two heads the former contains the charges for certain parts of the Engineer Establishments at the Presidency; the latter contains what its title indicates. All the above fourteen heads are confined exclusively to Public Works except the second, viz: "General Department," which besides containing certain Engineer allowances, comprizes also various transactions not pertaining to Public Works. In this Journal all refunds are credited to the same head to which the charges were debited.

The heads 1, 13, and 14 are closed to "Charges Military." No. 2 (General Department) to "Charges General of the General Department," and the heads Buildings Revenue &c. Nos. 3 to 6 to "Civil Buildings." These three closing entries are again closed to General Books, as are also the several heads Nos. 8 to 12 for repairs to buildings in the Civil Department. The head "Buildings Military" is closed to "the Honorable Company's Quick and Dead Stock;" and this latter, as well as "General Books" are finally closed to "Balance."

547. Little need be said of the Journal of the Superintendent of Roads. When the Superintendent draws money from a Collector or other Officer, he gives him credit in his Journal. Advances made for the construction or repair of roads are debited under the head "Advances on account of the Service of Government," and the allowances of the Superintendent, his Assistants, and their Establishments are charged under the head "Repairs of Roads." When the bills for actual charges incurred on the roads are sanctioned, the head "Advances on account of the Service of Government" is credited and that of "Repairs of Roads" is debited, whether the work be construction or repairs. The head "Public Roads" to show the charges for new work distinct from repairs, is not opened in this Journal. In debiting the head "Repairs of Roads" the necessary particulars are given; viz: a brief description of the work, and the date of the sanction of Government for the bills.

Remarks.
The Journal of the Superintendent of Roads.

There is also a monthly account particular in which the particulars of advances are entered. This shows the balance remaining on account of every separate Estimate, at the end of each month.

The following are the closing entries. For sums standing to the credit of Collectors the closing entry is "Remittances of the Revenue Department" and for those received from the Commissioner for the Government of the Territories of the Rajah of Mysore, and from the General Treasury at Fort St. George, it is "Remittances of the General Department." These closing heads, as well as the heads "Advances on account of the Service of Government" and "Repairs of Roads," are all closed to General Books.

548. The Journal of the Superintendent of Public Roads is much more simple, as his transactions are confined only to the General Treasury. It is furnished only quarterly. Whenever funds are obtained from the General Treasury credit is given to it. Advances for work are debited to the head "Advances on account of the Service of Government;" the purposes to which they refer are specified, and the particulars are given in a separate account particular. The actual charges on this account are debited to the head "Repairs of Public Roads." The charges for repairs to the buildings belonging to the Jail at Quindy are debited to "Charges General of the Judicial Department." In all other Journals charges of this nature are debited to "Repairs of Judicial Buildings" and that head is transferred to "Charges General of the Judicial Department" in the Territorial Journal. In the charges under the head "Repairs of Public Roads" the particulars of the work are given, and some vouchers sent to the Accountant General are quoted; but the sanction is not quoted.

The Journal of the Superintendent of Public Roads.

The head "Repairs of Public Roads" is closed to "Repairs of Roads;" and the head "Gene-

statements; and the circumstances connected with this attempt are alone sufficient to justify all that we have said as to the incompetency of the Collectors' Maramut Establishments, and the badness of the system of accounts. In spite of the persevering efforts of a laborious and able Secretary, the Board were unable for seven years to obtain from the Collectors the documents necessary to enable them to give even an approximate statement of the expenditure incurred. In March 1846, they promised to submit such statements, and they failed to do so till March 1853; every Annual Report in the interval contains expressions of their regret at being still obliged to submit the statements in the old form, on account of the delays in procuring the necessary subsidiary statements from the Collectors, and the errors found in them when received.

587. And the Statements in both Departments are very much wanting in useful detail. The Military Statement simply gives the total expenditure at each Station, but does not distinguish that on new Buildings from that on mere repairs. And there is no specification of particular works of importance, or any attempt to compare the grants for any object with the actual outlay. The statement of the Revenue Department is not less defective. That of April 1853, which is in the form newly adopted, gives the amount of expenditure in each District, on works of the various descriptions and departments: and the amounts expended on completed and on uncompleted works respectively, are shown separately, information which appears to us of little value. But, strange to say, in this Statement also, the simple and rudimental distinction between new works and mere repairs is not exhibited; and by a singular classification of which we cannot explain the reason, the outlay on Roads and Bridges is included in that on Civil Buildings. Financially neither of these two papers is of any value whatever.

The delay in their preparation and submission also deserves mention. The Military Statement forms a part of the general Statement of Military Expenditure, which is a very bulky document and usually requires between nine and ten months for completion. Being submitted in such a form too, it does not come specially under the review of the Government and is probably never seen by them. In the Revenue Department the time required is much longer. Under the old system two statements were sent up, the expenditure of one year erroneously and fallaciously compiled from the bills passed in one year; and the total amount of the estimates sanctioned in the following year. The Board's report of the 18th March 1850 was accompanied by a memo. shewing the dates of submission of all the annual statements since 1850; from which and the subsequent reports up to 1852, we find that as regards the disbursements the time between the close of the year to which the document referred and the date of its submission, ranged from one year and a quarter to four years and a half, the average term being two years and four months. In the present year as we have already said, the new form of statement has been adopted; it was sent in on the 17th March 1853, for the disbursements of 1850, being nearly two years and a quarter after the close of the period to which it refers.

588. From all these circumstances the present annual statements of disbursements on Public Works are useless for any real purpose; and the cause of this state of things is the badness of the existing system of accounts. And in saying this, it is not at all our intention to reflect on the Boards mentioned, but only to expose the very imperfect and defective character of the accounts in use. It is properly the duty of the Department which receives the accounts of the disbursements, and frames them into the final and systematic record of the expenditure, to prepare the yearly statements; but that Department, which at present is the Accountant General's Office is without the means of doing it. The task is therefore thrown upon the controlling Boards which at present have no systematic accounts; and they perform the duty as well as the means at their command permit. But in order to render the statements valuable, they must show the actual charges of the period to which they ostensibly refer, must show them in clear arrangement and classification, must afford the means of showing them in comparison with the grants for those several objects respectively, and of doing this within no long time after the close of the period in which the expenditure took place. And in order to that it is absolutely necessary that the existing system of accounts, from the very lowest, viz. the detailed charges of the execution, up to the highest where they are recorded in the most general and condensed form, should be thoroughly reformed and be brought into harmony and order. Till this is done one essential part of any real and effective control over the expenditure in this Department must be wanting. Now we have proposed a system designed to effect all the foregoing objects in a simple and easy mode; and by means of which full materials for the de-

tailed annual review and comparison will be before Government, certainly within six months of the year to be considered. That system we beg to commend to careful consideration.

589. We have adverted to the Dead Stock Accounts, and it appears proper to say a few words about them in this place. Formerly when the construction and repair of all buildings both at the Presidency and in the Interior were controlled by the Military Board; the dead stock accounts for buildings in all Departments were kept by that Board. When in 1838, the Superintending Engineers in the Divisions within the Frontier were abolished, and the construction and repair of all Civil buildings in the Provinces was transferred to the Board of Revenue, it was ordered that it should also keep the dead stock accounts of those buildings. In point of fact however that Board has never paid much attention to this duty. Under the Military Board systematic rules have been drawn out for estimating the value of buildings of the different classes, and for making allowance for deterioration, and on the whole the accounts have been kept with considerable regularity and exactness, particularly of late years. Under the Revenue Board nothing has been done beyond receiving annual returns of the Buildings from the Provinces; there has been no attempt to fix a value on them. The Dead stock books kept by the Military Board of the Buildings under their cognizance, though not complete, yet as far as they go, contain a tolerable approximation to the truth as to the present value of those Buildings. But as regards all other Buildings, being all those in the Provinces, there is no better information than that supplied by the Books of the Accountant General's Office; in which, for all Departments, only the original cost is given, without any allowance for depreciation. We may add that the Accountant General receives no information to enable him to correct his Accounts, so as to bring them into accordance with the fact. And this is a duty, in our opinion not pertaining to him, but to the authority which controls the Department; who should furnish him with the items for insertion in his accounts.

590. We give in Appendix M. the rules drawn up by the Military Board and approved by Government for annually adjusting the value of buildings. We do not give them as perfect, but as being in our opinion sound and well adapted to their object, though no doubt capable of improvement. It will be observed that these rules take no notice of mere ordinary repairs, looking on them as merely sufficient to remedy injuries; while it makes deduction, at certain rates for the several kinds of buildings, for deterioration, which in spite of such repairs must be considered to take place. Another plan, which is in use for the Canals of North India, is to add the ordinary repairs to the value of the work, and to make a larger deduction for deterioration. We do not pretend to judge between these two methods; the result of both is probably about the same; the former appears to us to have the advantage of greater simplicity, the latter is more exact, and makes the account more complete.

591. We must however strongly deprecate the course adopted by the Revenue Board viz. that of requiring the Collectors to send up every year bulky Statements shewing certain particulars of every Public building within their respective Districts. This is in accordance with the practice so general among the Presidency offices, of making the local Officers mere compilers of Statements for them, instead of themselves procuring the information and arranging it periodically for their own use. Under the present system these enormous Statements, are copied at full length year after year, at a great cost of labour by the overworked Collectors' Establishments; and as soon as they reach the Board's office they are thrown aside and never looked at again. Under a proper system, the central authority itself would have a list of all the buildings, written (or still better, printed) in a book, arranged according to the Department to which they belong, each under its proper District. The permanent description of the buildings, and the present circumstances and value of each, would be recorded in appropriate columns, and other columns would be left blank for the subsequent changes. Every year returns would be obtained from the Provinces, simply of the changes that had taken place, either by the construction or purchase, the sale or demolition, of buildings, or by additions or improvements &c; these would be entered in the Board's Register; and the new value of all buildings for the year would be computed, by deducting for depreciation at the due rate in each case, and by addition or subtraction as the case might be for the foregoing special causes. At the end of five or ten years all the columns of the register being full, a new list would have to be taken; and the advantage of printing would be that it would save the labour of writing out the whole.

The Dead Stock accounts.

The Military Board's Rules.

The practice in the Revenue Department.

A better mode proposed.

In both Departments the Statements are much wanting in detail.

And there is great delay in their submission.

The whole system of accounts must be reformed.

Dead stock accounts of Irrigation works and communications

592. Hitherto it has never been customary in this Presidency to keep dead stock accounts except for buildings. But we are strongly of opinion as stated in our First Report, that similar accounts ought by all means to be kept for all works; Roads, Canals, and Works of Irrigation. The accounts for works of these descriptions must be somewhat different from those for buildings, as they would require in general to exhibit the annual return obtained. We will not give an opinion as to the degree of detail in which it would be expedient to record these works, especially the numerous small works of Irrigation; whether each should be shown individually, or whether all under a certain amount each should be classed together for each Talook, or otherwise massed together. But we must repeat our conviction that some such record is necessary, if for no other use, yet for this at least, viz. to prevent or correct the habit now too prevalent, of regarding the expenditure on Irrigation and on the means of communication, as outgoing only, in almost entire forgetfulness of the enormous profit which it returns. In order to do this with respect to Roads, it may perhaps be found practicable as we suggested in our First Report, to make the amount and value of the traffic on the Road or the Canal, an element in the calculation.

The Financial Statement.

593. We have already adverted to the annual "Financial Statement," and we must here describe it in a few words. This document is prepared in the Accountant General's office at the close of each official year, and one copy is sent to Bengal and another to the Honorable Court. It is compiled from the journals of the various Subordinate Officers who keep accounts. For this purpose the whole of those journals are every month abstracted into a table called in the office the "Bengal Form," because originally furnished by the Indian Government. In this table the whole contents of the journals submitted to the Accountant General are extracted and posted every month, for each District or Department by itself. The Form contains sixteen columns, viz. one for each month except July, two for that month, (one to the 11th, and the other from the 12th to the 31st,) in order to keep the amounts of each Fussy year distinct, one for the totals of each such portion, and one for the grand total. A copy of this table is sent to the Government of India for each month, as soon as it is compiled. When completed for the whole year this table fills five volumes of Royal paper. This immense mass of details has then to be condensed into a single Statement in the same form for the whole Presidency; and this makes a sixth volume. And this having been done, that condensed Statement has then to be recast in a different form, and it then becomes the "Financial Statement."

Public Works how shown in it.

594. The charges having reference to Public Works are exhibited in the Financial Statement under two general heads, Ordinary and Extraordinary. The former appears to be intended to include all repairs, and the latter all new works; but inasmuch as all outlay on works of irrigation is included in the term "Repairs of Tanks and Watercourses," the whole of that outlay is exhibited as "Ordinary." Even the gigantic works on the Godavery come in under that term. The head "Ordinary" is divided into Civil and Military; and the former of these is again divided into General, Judicial, and Revenue. Under the term "General," a proportion of the Civil Engineers' charges is shown: also the repair of high roads &c., the Pay of Maramut Establishments, the charges for the repair of Boats and Buildings and some other charges. Under the head Judicial a proportion of Civil Engineers' charges is entered as well as Repairs of Judicial Buildings; and under Revenue appear a proportion of the Civil Engineers' charges, as well as the Repair of Revenue Buildings and of Tanks. The head "Military" contains the Repairs of Military Buildings.

The other head "Extraordinary" is also sub-divided into Civil and Military, and the former as before into General, Judicial, and Revenue. But in opposition to the practice in the case of Repairs, no charges for Public Works appear under the last two heads, but all new Buildings in the General, Judicial, Revenue, and Marine Departments, and all charges for the construction of roads and of boats, are entered under the term "General." Under the head "Military," only those for the erection of Military Buildings appear. The charges for Public Works are no where shown collectively in this Statement; neither is their classification judicious, or suited to give a good view of the expenditure on the several species of work.

It is not an authentic document.

595. The object in requiring the Financial Statement appears to have been to obtain some connected view of the financial position of the country at an earlier date than that at which at present the formal accounts can be made up. And in pursuance of that intention, and to obviate one cause of delay, it was ordered a few years ago, that all advances for services shall in this document be taken as actual charges, the amounts not ultimately expended out of those advances being cred-

ited afterwards to the head of Profit and Loss. Almost the whole of the expenditure on Public Works appears first as advances, and consequently nearly the whole of that expenditure as shown in the Financial Statement though appearing there as the actual charge, consists in fact of advances only. The Statement therefore is not authentic, and is calculated to mislead, because out of the amount which it exhibits as expenditure, no inconsiderable portion is not really expended but is returned to the Treasury under another term. It is from this document however that the accounts annually submitted to Parliament are prepared.

When the accounts of the Public Works Department are kept in the manner above proposed, it will no longer be necessary to exhibit the advances as charges, because the formal and authentic books, the Board's Journal and Ledger, will certainly be ready at a period prior to that at which the Financial Statement is now completed. The actual charges therefore may be taken into the Statement, which will then become, so far as this Department is concerned an authentic document.

It may be made so as regards the Public Works.

596. And it appears to us that by somewhat improved arrangements the necessity for preparing the "Financial Statement" at all might be entirely obviated. As already said it is a huge document, and the preparation of it involves a vast amount of labour, first in digesting the numerous Journals of the Subordinate Offices every month into the "Bengal Form"; and secondly in compiling the materials so obtained into the Statement. In consequence of the time necessary for its preparation, it is not even required to be ready till after three months, after the close of the year to which it refers, and in point of fact is not usually ready till much later. The statement of the official year 1847-48, terminating on the 30th April 1848, was not completed till the 9th January 1849, being more than eight months after the close of the year to which it belonged; and we are not aware that this amount of delay was unusual. The Territorial Books are required to be ready at the termination of one year from the end of that to which they refer, and appear to be completed within that term; and thus the whole time gained is only about four or five months.

And it might be dispensed with altogether.

Now we fully believe that by a better arrangement and with skilful hands, the Territorial Books might easily and certainly be completed within six months from the end of the year to which they belong. One requisite to this would be that the Journals of the Collectors and other Subordinate Officers of account for each month should all be dispatched to the Accountant General's Office punctually, as some are already, by the 15th of the following month; if this were insisted on it could certainly be secured in all Districts and from all Offices. Next, as to the Accountant General's Office itself. If the time expended in the preparation of the "Bengal Form" were devoted to throwing the Journals of all the Subordinate Officers into a monthly General Journal, the preparation of the General Journal for the year would be very greatly facilitated, and we feel no hesitation whatever in declaring from what we know to be done elsewhere, that with a good system, and with efficient men in the Office, the General Books would infallibly be completed within six months from the close of the year. Thus the whole supposed necessity for the "Financial Statement" would disappear; and the Government and the Honorable Court would have before them within a short time after the end of each year a perspicuous and authentic view of their Financial affairs for the year.

597. We cannot close this Section without again urging the necessity of establishing without delay the means of giving instruction in the true and simple method of accounts. In our Scheme of a College of Civil Engineering in our First Report we laid stress on this point; and the further our enquiries extend the more do we see the necessity of it, not in the Public Works Department only, but throughout all departments. At present the knowledge of accounts such as it is, is made a mystery. It is not long since the assertion was made that the knowledge of the method of closing the General Books, was confined to two or three persons in the Accountant General's Office, two of whom are now no longer in it. And we are informed that when that operation was to be performed, the parties retired into a room, and shut out all others, so as still to confine the knowledge to as limited a number as possible. The knowledge of accounts is not to be obtained generally; it is made a craft and a mystery, and is communicated from Father to Son, and guarded with the exclusiveness of a secret of trade.

A knowledge of accounts should be made general.

And if this is the case in the English accounts it is much more so in the Mahratta. Throughout the whole of our Revenue system perhaps no one arrangement has acted so powerfully in perpetuating abuses and preventing improvement as the retention of the Mahratta as the language of

the Revenue accounts. It has not only effectually prevented the European Officers from looking into the accounts and into the details of the Revenue; but even among the natives it has confined employment in that branch of the Public Service to a small class, interested to keep up the present system, which makes their peculiar knowledge valuable; and in particular it has excluded and will continue to exclude, almost all of those who have received any thing that can be called a liberal education. One of the very greatest practical and administrative improvements would be to abolish the Mahratta language and the Mahratta system from the accounts; and to adopt and enforce the English language, and the plain and straightforward English account system. We therefore urge that no time should be lost in using means to disseminate a knowledge of English accounts and Book-keeping, not only at the Presidency, but throughout the Provinces.

48
118

SECTION VIII.

SUMMARY, AND CONCLUDING REMARKS.

PART I.—SUMMARY OF THE REPORT.

598. We now proceed to give a summary of the recommendations which we have put forward in this Report. The subjects were treated in the following order. The first Section was devoted to the estimates, and the succeeding three Sections to the consideration of the executive systems in the three several branches of the Public Works Department; in the fifth we discussed the bills, in the sixth the subject of advances and the adjustment of advances, and in the seventh the classification of the charges for Public Works in the accounts.

Introductory.

599. In considering the estimates, we first enumerated and described the several kinds in each of the three branches of the Department and detailed the restrictions laid on the local officers as to the power of ordering works; more particularly as regards repairs. We pointed out that in the Military Department some measure of power has been conceded to the local authorities for the preservation of buildings; but that in the Civil or Revenue Department the Collector has scarcely any power to order the repair of buildings, although inconsistently his powers are very large as regards the repair of Irrigation works; and we noticed the long delays and other inconveniences resulting from the restriction.

The First Section;
Estimates.

600. We recommended that as a general rule all mere repairs to works of Irrigation, roads and buildings, should be permitted to be undertaken on the order of the proper local authorities. This is the case already to a great extent with the roads in the road department and with the Irrigation works; and we argued for the policy of extending the same rule to all classes of works, and stated our reason for believing that this might be done with perfect safety. As regards works of Irrigation we recommended that the practice of preparing annual lists of estimates for repairs should be abolished, and that those works like others should be repaired as soon as the necessity for repair might be discovered. Further, that many small improvements designed merely to maintain a tank or channel in full efficiency or to bring it to that state, should be included under the term "repairs" as they invariably are on the irrigation canals of the North West Provinces.

Recommendation
as to repairs.

As respects new works and improvements generally, we recommended that they should be reserved as at present for the orders of the Government; except that it seemed expedient, with reference to the discouraging effect of the present restrictions, and both as a measure of public advantage, and with a view to the benefit of the Revenue, that minor improvements to roads should be permitted to be undertaken by the Collector after conferring with the Inspecting Engineer, and under certain restrictions as to amount.

Recommendation
as to new works.

601. We next examined the forms of estimates now in use: and found much to condemn in those of the Revenue Department, on account of their cumbrous and unwieldy shape and the absence of simplicity. We detailed the mode of examining and checking the estimates by the several controlling authorities, and investigated the value of the several processes employed; and we recommended that the one hitherto regarded as the most important, viz. the recalculation of all the items in the detailed lists of measurements dimensions and rates, should be discontinued as quite useless.

The forms of estimates in use, and the mode of checking them.

We next considered the degree of minuteness with which an estimate ought to be made, in which respect there is much variation of practice in the department, and we pointed out some instances in which useless details are given. We then enquired what amount of detail is necessary to be sent up for the information of the controlling Board, and stated our opinion that a very large part of the detail now submitted is quite useless for the purposes of such a Board, and that the detailed measurements of estimates should not be sent up, but merely an abstract of them.

Degree of detail proper in an estimate.

Second Section;
the Road De-
partment execu-
tive system.

The agency em-
ployed.

The ticket system

The Station books.

Certain accounts
examined in de-
tail.

Improvements pro-
posed. Better
forms of Ac-
counts.

The bills will be
prepared easily
and promptly;
and be tested
very simply.

Third Section.
The Revenue De-
partment execu-
tive.

602. Having discussed the estimates, we next proceeded to consider the systems of performing work in the three branches of the department; this we did in some detail, giving one Section of the Report to each of the three. We took the system of the Road Department first in order, because that is the one in which we found most to approve, and which with some trifling modifications, we proposed for adoption throughout the whole department.

We first gave a general description of the system. We described the Agency employed, under the Commissioned executive officers; viz. 1st, the roadmen, who are only a sort of head workmen stationed one to each six miles of road, to perform petty repairs, &c; 2nd, the Pygnuts and Conacapillays, whose duty it is to superintend gangs of workmen on the road or at the quarries, and to issue to them their daily tickets under certain precise rules, but not to disburse money; 3rd, the Maistries, who are employed in a similar manner on bridges under construction or repair; and lastly the Overseers, mostly Europeans, who check the work done by those lower grades, and cash the tickets issued by them.

We next spoke of the tickets used in the Department and the mode of using them; remarking that their employment has been more reduced to system in the Road Department than elsewhere. And we adverted to the good results of their use, in securing punctual payment without costly supervision, and in greatly economizing superintendence and saving office work.

And lastly we described another distinctive feature in the executive arrangements of this Department, viz. the "Station Books," which when properly kept ensure accurate accounts of the work done from day to day, in the most concise form, always present for inspection exactly when and where required, and yet with the smallest expenditure of labour.

603. Having given this general sketch of the system, we next went on to examine more minutely the actual accounts of certain work lately performed in the department, viz. those of the repair of a Division of No. 1 Trunk Road for a half year, and those for the construction of the Bridge over the Palmanair river. We described the accounts of these works as we found them, noticing the defects and omissions occurring in the practical working of the system as compared with its intention and design; in particular, negligence in keeping the accounts especially in the case of the Palmanair bridge, and the cashing the tickets much too unfrequently. We went through all the books, describing them minutely; and we dwelt upon the excessive amount of useless detail accumulated in the bills, and the multifarious and complicated calculations required to prepare them, partly in consequence of the minute details given, and partly from the want of simple means of deducing the aggregate charges from the detailed accounts.

604. Lastly, we stated the improvements which it seems expedient to make in the department, and which are directed chiefly to the simplification of the accounts. We gave forms for the several accounts necessary to be kept, not greatly differing in general from those already in use in the department, but more clear and more concise. As respects the bills, we proposed to discard in future the useless minutiae of detail hitherto given, and to make the bills more like what they now are in the Military Department; still showing the actual facts of the expenditure, but not with the same artificial subdivision.

The new forms of the Station books and the cash book will harmonize exactly with the classification in the bill. So that both the bill may be made up, with the aid of an abstract of the Cash book, at any time, and almost in a few minutes, by simply transferring the items there found; and also that it may be collated at any time with the Station books, the real vouchers for the charges, and so subjected to the most effectual audit, with the utmost ease. With the improvements thus made; viz. with this high degree of simplicity and clearness in the accounts, and of promptitude and certainty in making up the charges; and with the additional care in working the system which our enquiries show to be necessary, and for which this diminution of useless work will afford the leisure, it is our decided opinion that the executive system of the Road Department ought to be made general throughout the whole department of Public Works.

605. The third Section was devoted to an examination of the executive system in the Revenue or Maramut Department, in which we found almost all the arrangements and modes of proceeding the direct contrary of the simplicity and straightforwardness of those in the Road Department. We first reviewed the existing system, drawing our information partly from the replies of the Collectors and the Civil Engineers to our Circulars: partly from the viva voce examination of subor-

dinate servants in the department, called up from certain Collectorates; and partly from a careful scrutiny into the actual accounts of six works of different kinds in the same number of Districts. The last mentioned source of information was the fullest and the most exact; the works taken were chosen merely by reference to the bills lying in the Office of the Board of Revenue and from consideration of their amount and the nature of the works; and having thus made the selection, we wrote to the respective Collectors for all the accounts and papers connected with those cases. Thus they may fairly be regarded as fair samples of the system.

606. We examined those accounts in detail, pointing out the defects in each. Some grave faults we found common to all in a greater or less degree, viz. excessive bulkiness, and very confused and complicated arrangement, or rather absence of arrangement; both concurring to make effective examination and check impossible, and acting far more effectually as a shield to fraud than if there were no detailed accounts at all. We found also that the daily accounts of expenditure in this department are quite untrustworthy.

Having gone through those accounts we next examined the operation of the system as to certain particular points, still making use of the same documents. First as to the mode of preparing the bills; i. e. of stating the actual cost of work. The mode of doing this, which under a good system is quite simple and transparent, we found to be so shrouded in mystery through the numerous and complex steps employed, that we could hardly gain any clear idea of it. But we learnt fully enough to satisfy us that the bills are not made up from the daily accounts, which under efficient executive are the sole element, and besides which there can be no other truthful means, but that they are manufactured by means of a series of involved and complicated processes, to agree with the estimates.

Next as to the mode of paying the work-people: we found that the only guarantee offered by the system that those payments are truly made, viz. the signature of the people themselves, is quite unworthy of trust; and that as a fact it entirely fails to secure the people from exaction and oppression, or the Government from fraud and speculation.

607. We then adverted to the very great delay prevailing both in the execution of work in this department and in the preparation and submission of the bills. On this point also we drew examples from a large number of actual cases taken at random, in addition to those found in the particular works already remarked on. And after noticing the serious evil of these delays, which extend to the most minute cases, we pointed out that they are due to causes inherent in the existing system; and that under that system the most active officers can do but little to diminish them.

Lastly we spoke of the excessive quantity of correspondence and documents necessary under the present system, altogether independently of and in addition to the accounts; and adverted to the heavy tax imposed on the village officers and the labourers, in the frequent journeys which they are compelled to make to the Tahsildar's Cutcherry, and from their detention there.

608. Having thus gone over the system, detailed its actual working, and illustrated it by examples, we came to the remedy. We declared our conviction that it would be useless to attempt to amend a system so radically defective; labouring under the compound and complicated evils of having agents fully occupied with other primary duties; unprepared for their duty in this department by any previous training; under no efficient Superintendence or control; and practically from various causes, almost secure of immunity whatever may be their delinquencies. The remedy which we proposed as absolutely necessary, was to constitute a separate executive agency under Engineer Officers, and entirely unconnected with and independent of the Revenue Officers. And we showed that this vast improvement can be carried into effect at a cost not exceeding what would be required for the reform of the present system; which would place it in a condition of comparative efficiency, though still, of necessity, retaining most of its radical defects.

609. We considered such objections to this plan as had come to our knowledge; and in particular that which alleges the impossibility of Engineer Officers obtaining labourers for Public Works without the authority of the Revenue Officers exerted in their aid. We proved by actual examples that this objection is wholly fallacious; that no such difficulty really exists, but that abundance of labour is always forthcoming, and at wages no higher than are actually charged to Government at present, at the call either of Engineer Officers or of private persons, wherever the people are able to feel confidence that they will be paid punctually and honestly.

The accounts of
certain works
examined.
Some grave faults
universal.

The mode of pre-
paring the bills.

The payment of
the workpeople.

The great delays.

Very bulky Corres-
pondence, Re-
ports, &c.

The remedy; a se-
parate executive
under Engineer
Officers.

The aid of the Re-
venue Depart-
ment is not re-
quired.

The separation is necessary in order to put a stop to the forcing of labour.

We further declared our conviction that the separation of the Revenue Department from all concern with the execution of Public Works is absolutely necessary in order to put a stop to the practice of forcing or pressing workmen. We proved by two most striking cases, that if the people are only assured of being fairly treated and punctually and honestly paid, labour will be forthcoming on demand at very moderate rates, even under the most adverse circumstances and in the most difficult situations. But we observed that the only aid that Tahsildars can give in providing labour is by employing the authority of the Collector to force it, and that as long as they are relied on to supply labour, so long such compulsion will be used. Lastly we declared our decided opinion that the aid of the Revenue Department in executing Public Works is not only not wanted, but that it is a positive evil, both as respects the Government and the labourers.

Subordinate arrangements.

610. We then went on to describe the proposed arrangements of the new executive, and the distribution of its agents; which arrangements and distribution are framed generally on the model of the Road Department. We propose to have an Engineer in each District as the head of the executive within it; with subordinate European Agents, Sub Engineers and Overseers, charged with the immediate executive functions within the circles or sub-divisions into which the District is to be partitioned, as the Overseer in the Road Department has charge of those in his division of road; employed on similar duties and with similar inferior functionaries under them.

The advantages of the change.

We showed how much gain there would be under such a system in promptitude of execution; how much diminution there would be in the quantity of accounts and correspondence; and how much saving in office establishments; that the accounts would be clear and concise; that the bills would be directly prepared from them, and capable of direct and instantaneous collation with them; and that the whole department and all its operations would be under effective and intelligent direction and control, which now are entirely wanting.

Distribution of duties.

We closed the Section with a brief sketch of the respective duties of the Collector, the Inspecting Engineer, and the District Engineer under the proposed arrangement.

The Fourth Section. The Military executive system.

611. The Fourth Section contained an examination of the executive system of the Military branch of the Department. For the sake of presenting this with accuracy, we took the Presidency Division as a sample of the whole, and described the practice there with exactness. The execution of works in this Division is under a "Superintending Engineer" with an Assistant and an Establishment. Building materials, and all other articles required, down to the most minute, are furnished by one general contract "Supplier;" Carpenters' work is done in a Carpenter's yard attached to the Superintending Engineer's office. In both these respects this Division differs from others. We stated what appear to us strong objections to the present method of obtaining materials: and suggested also that the Carpenter's yard may be made more useful than it now is.

The Subordinate Agency.

We then described the agency for executing work and the course of proceeding. There is a maistry and an accountant to each work or set of small works; the former to direct the workmen the latter to keep the accounts. And we noticed that these persons are not permanent servants of the department, but are merely employed on daily wages when there is work for them; and those wages very low, much lower than those of some of the work people whom they are set to superintend.

We described the detailed accounts received daily from the works by the Engineer and transcribed into tables in the office; as well as the method in use for checking those reports, which we did not see reason to regard as very efficacious.

The mode of paying the work people.

612. We next proceeded to consider the mode of paying the work people in this Department. We described the difficulties and delays in the way of getting the money from the Engineer's office, so that the common labourers who are paid weekly do not get the wages of one week till the middle of the next, and the artizan classes who are paid monthly, do not get the amount due for one month till the 15th or 25th of the following month. We noticed also a practice peculiar to the Military Department, viz. that the work people are left entirely to the inferior accountants above mentioned for the payment of their wages. These persons receive from the Engineer the amount due, for distribution to the work people; but if they withhold payment, the Officers of the Department do not interfere, but refer the defrauded workmen to the Small Cause Court. We argued that though this course seems at first sight hard on the labourers, yet no doubt the real losers by it, are the Government.

613. We next adverted to the practice of settling and paying the supplier's bills for materials every month, and noticed the delay which occurs in this settlement, in consequence of the complicated and circuitous methods followed; so that though nominally the settlements are monthly, yet that in fact they usually take place not till from three to six months after the months to which they relate.

The settlement of the Supplier's bills.

We then described the mode of preparing the bills for work performed in this department. We observed that as regards the charges for labour the method is simple; but that it is an operation of much complexity to determine the cost of materials and articles furnished by the supplier, and that it is made more so by the means used. We noticed also the long delays in the preparation of the bills, and the heavy arrears of bills now in the office in consequence; both which evils might be obviated by the adoption of better forms of accounts and simpler processes.

The preparation of the bills for work executed.

614. Lastly as an instance of the actual operation of the system, we detailed the progress of one work through all its stages, from the first application reporting the necessity of the repair, to the final adjustment of the accounts. We found considerable delay in the preparation of the estimate, although the case was one of a very pressing character; but much promptitude in the execution when once the work was commenced. In the preparation and submission of the bill again, there was very great delay; as well as in the subsequent operations of obtaining sanction and adjusting the accounts, for which however the responsibility does not rest on the Superintending Engineer. The accounts of the work also we found to be very needlessly bulky.

Detail of an actual example.

615. Our recommendations for the improvement of this branch of the executive were directed to the simplification and abridgement of the accounts. The ends to be thereby attained were to give the Engineer equal or greater control over his subordinate agents, at a much less expenditure of time and labour in the office; to diminish the present delays in the payment of the work people; and very greatly to facilitate and expedite the preparation of the bill, and its comparison with its proper vouchers. For this purpose we drew up forms of the several accounts required, which are printed in the Appendix, and of which we explained the preparation and the use.

Recommendations. Improved forms of accounts.

These amendments were designed to improve the working of the existing system, without introducing any material change in its arrangements. But we further stated our opinion that the true way of placing the executive in this Department, as in the Revenue Department, upon a right basis, would be to introduce into it that which we have described as the system of the Road Department; and we briefly pointed out how easily this could be done both in the Presidency Division, and in the other purely Military Divisions.

The Road Department System to be adopted.

We concluded the Section with a reference to the practice of exacting a money security from the Executive Engineers in the Military Department, and to that of requiring Survey reports on works executed in the same Department. We recommended for reasons stated, that both practices should be entirely abandoned; and that in the case of the latter, an effective inspection and oversight by the Inspecting Engineer should be substituted.

Money security, and Survey Reports.

616. The Fifth Section was devoted to the consideration of the Bills. - We first discussed their form. We described the forms now used, and recommended that the artificial and fictitious form of the Revenue Department Bills should be abolished, and the natural and simple form be substituted. Also that the complication and superfluous matters introduced into the bills in the same Department should be discontinued, and that a bill should be sent only once. And that the bills should be sent up singly, and with detail of facts; instead of in long lists of several hundreds together, and merely in abstract.

The Fifth Section of the Bills. Their form.

We recommended also that the declaration on Honour now appended to the bills in the Military Department and in that only, should be discontinued; as being not simply superfluous but injurious.

617. We strongly recommended also that in works of any considerable magnitude, bills should be made up and submitted half yearly during their progress; and that in all cases of works in course of execution at the close of the official year, bills up to that time should be submitted. And we pointed out the case with which this practice might be followed, and the serious inconveniences and delays of the present system.

Periodical bills recommended.

We recommended also that bills for tools and machinery should in like manner be settled as soon after the purchase as possible. And we dwelt on the great necessity of encouraging the use.

Bills for tools and Machinery.

of improved constructive means, and of allowing the Engineer much latitude in the selection of such means; showing the very bad effects of restrictions in this particular, by an appeal to the results in Ceylon.

618. We next considered the mode of auditing the bill; detailing the system followed in each of the three branches of the Department. In the Military Department we found the audit complicated by the needless transmission of the bills backwards and forwards between several different offices; and by a useless repetition of processes; but yet effective to this extent, viz. that the admission into accounts of charges not duly passed is prevented.

In the Revenue Department we found a far more imperfect audit. The very form of the bills prevents any real examination, and the departmental audit is confined to the mere testing of the few arithmetical calculations apparent on the face of a bill made up without detail. The so called audit in the Civil Auditor's office, is of the most unbusinesslike and irregular character; advances and charges being mixed up together in a manner which inevitably causes confusion and uncertainty.

The chief audit of the bills of the Road Department is in the office of the Superintendent, the same officer who draws the money expended and is debited with it, and superintends the execution of the work. The only other audit of the bills is a mere arithmetical one in the office of the Civil Auditor which we have no hesitation in pronouncing useless. The operations of the Civil Auditor's Office as respects the advances in this Department, are the same as in the Revenue Department.

619. Having thus set forth the system of auditing the bills for Public Works, we examined the value of the several processes employed, and stated our opinion that their efficacy in ensuring the justness of the charge is not great. We then proposed what we thought an effectual means of securing that object, by combining local knowledge with examination by the central authority. The audit by the Board to be final.

Lastly we recommended a change in the mode of auditing the salaries of the Establishments both in the Revenue and the Road Departments. In the former, the salaries of all the District Establishments receive the sanction of Government every year; in the latter a large part of the salaries are paid out of estimates for particular works. Both plans are open to objection; and we recommended that, in both Departments, the fixed Establishments should uniformly be paid, and the charges be passed by the Audit office, as in the case of other Establishments.

620. We next considered the authorities proper to be empowered to pass bills. At present this power is confined almost exclusively to the Government itself; who are thus loaded with much detailed work, which they have no means of performing in an effectual manner. We recommended that the Board of Public Works should have authority to pass all bills for repairs undertaken under the general sanction of Government; and all bills for new work not exceeding the estimates by more than 5 per cent. And we pointed out that in Bengal the Military Board has for many years been vested with similar power.

621. We concluded our remarks on the subject of the bills, with some notice of the delays occurring in their preparation, submission, and audit. These delays are greatest in the Revenue Department and least in the Military Department. On the average of several Districts, the bills for the ordinary repair of works of Irrigation, occupy one year and eleven months from the completion of the work to the passing of the bill by Government. In the case of other works in the Revenue Department the time is still longer, averaging upwards of two years on a large number of works; while in some cases the delay is much greater, extending even to above four years after the completion of the work.

In the Road Department the mean delay on a number of works averaged 625 days and the longest was three years and four months. In the Revenue Department there is great delay in the preparation of the bill; in the Road Department that operation occupies but little time, and by far the greater part of the delay above noticed was in the office of the Superintendent. We have reason to believe that now, under a change of practice introduced by the present Superintendent, the bills are submitted much more expeditiously.

In the Military Department the delays prior to the sanction of the bill by Government are much less than in either of the other two Departments. The average term, on a number of works, was 187 days from the date of the Survey to the passing of the bill by Government; but the Sur-

The audit in the Military Department.

In the Revenue Department.

In the Road Department.

Mode of audit recommended.

Audit of establishment charges.

Rule as to the passing of bills for work.

Delays in the Revenue Department.

In the Road Department.

In the Military Department.

vey did not always follow closely on the completion. After the passing of the bill by Government there is a further delay in this Department in consequence of the second audit of the bills by the Military Auditor General and the delays in the Accountant General's Office, amounting on the average of the same works, to 134 days, or four months and a half.

These delays are a very serious evil. We pointed out how they might be shortened in some degree in each of the three departments; but we declared that the only effectual remedy, especially in the Revenue Department where they are much the worst, will be to substitute a trained and efficient executive and simple and lucid accounts, for the incompetent agency and the confused and untrustworthy accounts now existing.

622. The Sixth Section was occupied with the subject of advances for the execution of work and the adjustment of such advances. We first detailed the system in the Military Department, where the whole details of the advances are under the close supervision of the Accountant General, and the adjustment is actually made in his office. We found the system effectual to its main objects; but by means needlessly tedious, circuitous, and laborious.

In the Revenue Department we found a total absence of control over the advances. The information respecting them given in the Collectors' Journals is excessively meagre and vague. And it is the same with the adjustments; large sums are in fact entered as charges every year in adjustment of advances, without any sanction, and without even the submission of bills. We observed that the Government consider it to be the duty rather of the Board of Revenue than of the Accountant General to regulate the advances in this Department and to ensure their due adjustment; but the Board is not at present possessed of the information essential to the exercise of such control, and that in fact it has never exercised it.

The system of receiving advances and making adjustments in the Road Department is in most respects similar to that in the Revenue Department; the chief difference being that the Superintendent having no treasury of his own, receives advances from the Collectors. No check is exercised over the amounts advanced. Neither the Accountant General nor the Collector receives intimation from Government of estimates sanctioned; and it is left to the Superintendent himself to take care that he does not draw beyond the limit of Four lacs yearly allowed for the expenditure of the Department.

623. Having thus detailed the existing system as respects advances and adjustments in each of the three sections of the Department, we proceeded to detail the changes which we proposed. We found in one branch a system in operation which indeed effectually controlled the issue of advances and secured their due adjustment, but at the expense of much needless time and labour, and much impediment to the operations of the Department; in the other two, we found an almost total absence of control. Our object was to substitute a system adapted to the new executive arrangements which we have recommended, and calculated to secure an effectual and wholesome control over the advances of cash, the expenditure, and the adjustment by bill by a simple machinery and without minute interference in details on the part of the central controlling authority.

624. The means by which we propose to effect this are as follow. Prior to the commencement of each official year, a budget shall be presented to Government by the Board of Public Works exhibiting all the expenditures proposed to be made during the year; for the most part it will be founded on actual sanctions already granted by Government, but in a few minor particulars it will be based on the average expenditure of past years. This budget when sanctioned by Government, to be communicated to the Accountant General and to the several Collectors and other disbursing Officers, so far as they are respectively concerned in it, as their warrant and limit for issuing money to the Engineer Department. Further, to enable the disbursing Officer to provide the required funds where wanted, a monthly cash estimate shall be prepared by every District and Executive Engineer, stating in detail what amount he will need during the ensuing month, and in what Talooks; and the Inspecting Engineer having approved of this, will give the Officer a credit for the amount on the proper Collector or other officer, in favour of the Engineers, who will then draw on this credit in favor of his subordinate executive agents.

625. The following will be the means of checking these advances. The total amounts issued to the Engineer officer will be debited in the Journal of the disbursing officer; and the Accountant General will compare the debit there found with the corresponding credit in the Journal of the

The remedy.

The Sixth Section; the advances and adjustments. The Military Department.

The Revenue Department.

In the Road Department.

Change of system proposed.

An Annual Budget.

Monthly credits.

The check over the advances.

Board of Public Works; both Journals being submitted to him monthly. This will be the check on the total amount; the detailed check will be exercised by the Board of Public Works. For this purpose they will receive monthly Accounts Current from the District and Executive Engineers, and statements from the Collectors through the Inspecting Engineers, of the amounts issued. And the adjustment of the advances by bills for work performed, will be subject to a similar twofold check. The Board, by means of the monthly Accounts Current, and of the bills, will secure that adjustment with exactness and punctuality, and will enter the actual charges in their Journal; and the Accountant General, comparing the total charges with the advances made and the balance shown, will ensure their correctness in the aggregate. The system appears to us simple and effectual, and adapted to secure a real control over the operations of the Department; while it both leaves freedom of action, and provides means for the rapid submission of bills and closing of accounts.

And over the adjustments.

Disbursements in the Talooks.

626. We concluded the Section with some remarks on the present system of making payments from the Talook Treasuries. It is now required that all monies received in the Talooks shall be sent to the Collector's Treasury and that all sums requiring to be disbursed in the Talook shall be sent back specially and separately. This practice involves very serious inconveniences, both to the Public Service and to individuals; and Government have been compelled to relax the rule on some points. The reason for maintaining it at all is a distrust of the Tahsildars. But we showed, 1st, that larger sums are now actually left under the charge of those officers and for longer times, than would be necessary under a different system; 2nd, that though distrusted in this comparatively trifling matter, Tahsildars are trusted with much more extensive and uncontrolled power in other ways; and 3rd that a few very brief and simple accounts, involving much less trouble than those at present in use, would give the Collector as complete control over cash in the hands of the Tahsildars, as if it were actually in his own Treasury. We recommended therefore that the present practice should be abandoned, and that the funds required for the disbursements of the Talook during the month should be retained out of the Receipts; and we pointed out how this could be easily and safely managed.

The Seventh Section.
The classification of the charges for Public Works.

627. In the Seventh Section we examined the present mode of exhibiting the charges for Public Works in the Public accounts. We first described the composition of the various subordinate books from which the General Territorial Books are compiled, and then those Books themselves. We reviewed the classification of the charges in those Books, which are the great and final record of financial concerns of this Presidency, and we pointed out that this classification is faulty in several respects; it clubs together things distinct in their nature, while on the other hand it fails to exhibit in a separate form some of the leading and most important divisions of Public Works expenditure. Thus in the case of works of Irrigation, the largest division of that expenditure, new works and mere repairs are clubbed together, and can nowhere be found separately; so also all the new roads constructed by the Superintendent of Roads are exhibited in the accounts under the head of *Improvements*, though the cost of the Public Works Establishments is charged under a variety of distinct heads, and cannot be brought together without great labour.

A set of Books to be kept by the Board of Public Works.

628. Having thus described the existing system of the Books and noticed some defects in it, we detailed the system which we would substitute. We proposed in the first place that the Board of Public Works should keep a set of Books for the Public Works Department, as the head of other Departments keep books of the expenditure of those Departments. Those books to be compiled monthly and transmitted to the Accountant General. In order to avoid delay, and to preserve adherence to the rule of recording all expenditures in chronological order, we recommended that the charges should be debited as soon as the bills should be passed by the District Engineer, and that the final examination by the Board should be made afterwards. We observed that this is the course already followed with almost the whole of the charges under this Presidency, and that the audit and retrenchment follow with certainty and punctuality. And we pointed out that the retrenchments in the Public Works Department are utterly insignificant, and that under the clear and simple system of accounts proposed by us the audit will follow immediately.

Proposed classification of the charges.

629. We then detailed that mode of classifying the charges which appeared to us the best; being adapted to exhibit them in their natural division and arrangement, and to give a clear and concise view of the expenditure. We proposed that the books compiled by the Board of Public

Works should be submitted to the examination of the Accountant General, those for each month being sent to him immediately for that purpose and for ultimate incorporation in his General Books.

As a further means of controlling the expenditure, we recommended that at the close of each year a Balance sheet should be prepared by the Board, comparing every item of the Budget with the corresponding expenditure; each grant for the year being shown in comparison with the actual disbursement on that account in the year, with explanation of all instances in which the grant had been exceeded. We proposed that this Balance sheet should be sent to the Accountant General; who should report to Government on all those cases in which grants had been exceeded or in which money granted for one object had been applied to another, and on the sufficiency of the explanation given by the Board. And we pointed out how entirely this valuable species of control over the expenditure is now wanting; and that it can never be attained without a thorough reform of the accounts of the Department.

An Annual Balance Sheet.

We closed the section with a few observations on the Dead Stock accounts, and on the annual Financial Statement.

PART II.—CONCLUDING REMARKS.

630. We will here make a few remarks on a subject of some importance in the Department of Public Works; viz. that of the execution of work by contract. We do not propose to go into it in much detail, but we will state the general conclusions to which we have been led after careful enquiry and consideration.

Contracts.

And first we would observe that conclusions as to the advantage of contracts in this country, cannot safely be drawn from their success in England. Two conditions are absolutely necessary to the healthy existence of a system of doing work by contract: there must be a number of men possessed of skill and capital sufficient for carrying on work; and on the other hand there must be a number of unconnected parties having frequent occasion to engage the services of Contractors. It will at once be admitted that the first mentioned condition is necessary, because without it there cannot be that free competition among the tenderers in which lies the whole efficacy of the contract system in securing fair rates of charge. But the second is in fact not less essential; for such market for the services of Contractors is necessary, in order to create a body of persons able and prepared to undertake the performance of work.

631. Now both these conditions are found in an eminent degree in England; numerous and unconnected parties, whether the Government, local authorities, private companies, or individuals, are continually requiring to have work of every description performed on contract, and the result is a numerous body of persons who make it their chief employment to execute work on such terms, and who are able from the constancy of the demand to keep up the necessary Establishments, Plant, and stocks of materials. But in this country all this is entirely changed. Even at the Presidency the Government is almost the only employer of Contractors, and as a consequence there is no body of able and well provided Contractors, and no free competition. It deserves remark too that thought here are two persons of European descent, and of some capital, skill and character, following the occupation of builders at Madras, yet they confine their operations wholly to works undertaken by private members of Society, and do not tender for Government works. We learn from the Secretary to the Military Board that no person of that superior class has offered for any Government work, since the Vepery Church and two bridges were built by the late Mr. Law about 25 and 30 years ago. The parties who compete for Government Contracts, even at the Presidency, are for the most part men of no capital, who depend for the means of fulfilling their engagements entirely on the advances which they receive, and who sometimes pay heavy interest even on the "Company's Paper" which they borrow to deposit as security. To men of this

Conditions of success wanting in this country.

stamp the mere circumstance of getting the cash advance is an object, and they often tender at rates so low as to make fair profit almost impossible, trusting to the chance of what they may be able to make by inferior work. Hence the necessity of close and unremitting supervision of their operations.

Contracts in the Military Department.

632. But we will make a few more particular observations, first with reference to the Contracts in the Military Department, and more especially at the Presidency, and second, in the Revenue Department. Contracts have been in use in the Presidency Division to a limited extent for many years, and both the Government and the Honorable Court have at various times expressed their wish that they should be resorted to more largely. Within the last three or four years, especially, the Military Board have given their particular attention to the subject, and have endeavoured to extend the use of Contracts both at the Presidency and at the Stations in the Interior and these endeavours have been attended with some success. Prior to the year 1850, the amount of work done by contract in the Presidency Division was trifling; in the three years 1850-51 to 1852-53 it amounted to 76,889 Rupees out of a total of work performed of 1,54,291. In the Interior it can hardly be said that any work at all had ever been done by contract prior to 1850; in the three years above mentioned the contract work was 6021 Rs. at nineteen Stations; the total outlay having been 1,40,197 Rupees at those Stations, and at all the Stations in the Interior 4,36,925 Rupees. In every case the rule has been followed of taking the lowest tender, subject only to the condition of the proper security being furnished, if advances of cash were required.

On the whole, the result of the contracts at the Presidency is a difference between the amount of the sanctioned estimates and the Contracts, of Rupees 21,440; the total of the former having been Rupees 1,37,698, and of the latter Rupees 1,16,258; being an apparent saving of 15½ per Cent. This however cannot be all set down as gain by the use of Contracts, because in many instances the whole of the work estimated for was not performed, and also because the works executed by the Engineer Department also are usually completed under the estimate. The Government have in recent years been so peremptory in requiring that the bill shall in all cases be within the estimate, that Officers have been driven in self defence to make their estimates high. At the Stations in the Interior, with the single exception of Bellary, it cannot be said that there was any saving at all by the use of contracts; the amounts of the Estimate and the contract being in every case almost exactly the same.

Contracts have not yet lessened the labour of the officers of Government.

633. During the past year the endeavours of the Military Board have been steadily directed to the object of removing discouragements from the way of Contractors, by facilitating the issuing of advances, the settlement of their accounts and payment of their bills. All these measures are improvements, but still there appears to be room for further progress in the same direction.

It may be added that the larger resort to Contracts has hitherto in no degree lessened, but has much increased, the labour of the Military Board and of the Superintending Engineer. The most careful and vigilant supervision is necessary over works in course of execution, in order to prevent fraud. And in spite of all that could be done, there have been frequent attempts to make use of inferior materials and workmanship, and beams of deficient length have been put up. In one case a large quantity of masonry was executed surreptitiously by night, and on inspection was found so bad that it had to be pulled down again. There has been much dilatoriness also in the execution of work; and the correspondence thence arising has added to the labours of both offices. In the case of three of the principal works given on Contract, the engagements have been annulled, and the works completed by the Superintending Engineer.

The Superintending Engineer ought not to inspect Contract works.

634. The following are the measures which appear to us expedient with the view of improving the operation of the Contract system at the Presidency. The plan of working by Contract is stated to be distasteful to the servants of the Superintending Engineer's Office; and they are considered by the Contractors as designedly throwing difficulties in their way, which they have the means of doing in the ordinary course of their duty. Masters of the Department deputed to inspect materials collected or works performed can object to them on slight grounds, and even if the objection is overruled, the Contractor's people are kept idle. Or they can delay to come to inspect materials collected, or to examine buildings reported to have been completed; or the report to the Military Board on which alone the Contractor can obtain advances or payments may be delayed. All these and other means of annoyance are in the power of the people of the Superintending Engineer's Office, and are asserted to be employed; we examined two of the principal

Contractors, and both of them complained much of the difficulties and delays which they had to encounter, partly through the ill will of the Superintending Engineer's Office, and partly in consequence of having to attend at so many offices before they could get their money. A change was made last year in the mode of inspecting work done on Contract, by assigning this duty to the Superintending Engineer instead of the Chief Engineer; this arrangement is objectionable as pointed out in our First Report (Para 194,) on account of the feeling prevailing in the office, and because the Superintending Engineer's Department is that on which the execution of the work will devolve in the event of the annulment of a contract. As respects the Chief Engineer the change was a decided improvement, as it relieved him from a duty quite unsuited to his position.

635. Again the duty of receiving tenders and deciding upon them, and generally of controlling the progress of the Contract, and of sanctioning the issue of the advances of cash to the Contractors, is laid upon the Military Board; but this too is in our opinion objectionable. It is a duty requiring promptitude of decision and action, and any delay is an injustice and occasion of loss to the Contractors; but a Board is and must be unsuited to such functions, not deliberative, but active and executive; and as a fact, although in order to obviate loss of time the Board have empowered their Secretary to order advances in their name without their knowledge or concurrence, still delays occur and are complained of. At present however there is no authority, other than the Superintending Engineer in the one case and the Military Board in the other, on whom these duties both of deciding on tenders, controlling Contracts, making advances, and inspecting work, can properly be laid; but when there shall be an Inspecting Engineer in the Division, these functions will properly be included among those assigned to him. The Board will then be freed from local duties of detail, and will be in its proper position of control over works and Establishments at the Presidency as well as in the Interior; and in case of ground of complaint, Contractors will have a place of appeal, of which they are now destitute. This change in both its parts, in relieving both the controlling Board and the executive Department from immediate concern with the contracts, will powerfully tend to remove obstacles which now operate to prevent men of respectability and capital from entering the field as Contractors.

The Military Board ought not to have the Superintendence of contracts.

636. Another change tending in the same direction would be to cease to make the amount the sole point attended to in deciding on the tenders, and to look also to the competency of the party to fulfill his engagement. It is true that this would alter the character of the question at issue; instead of being one of simple fact, viz. which tender was for the lowest sum, it would become one of opinion, and so an opening would be made for possible abuse and jobbing. But if this is deemed a valid objection against giving that discretion in its full extent, it may at least be permitted that a tender may be refused even though the lowest received, if the party shall have once failed to complete a contract with the Department unless under unavoidable or unexpected circumstances. This is even now acted so to some extent, but too little freedom of choice is exercised. It may be taken as an axiom that only needy men will take a contract on illiberal terms, and men of that stamp will and do eagerly engage for the execution of work at rates for which they cannot perform it, merely for the sake of getting the advances into their hands; and thus delays and vexations ensue. If it be really desired to attract men of capital and character into this occupation, more liberality must be shown in accepting tenders.

More liberality must be shown as to terms.

637. Further it appears desirable with the same object of getting rid of the class of needy men without the means of fulfilling their engagements, to exercise more strictness than has hitherto been shown in exacting a rigid adherence to the stipulations made, as to time as well as to other conditions. At first sight this may seem more likely to deter than to attract; but it seems to us that though it would deter or scare away the pauper class of contractors, yet that jointly with the change just proposed in the mode of deciding on tenders, it would tend to bring forward men of higher character, and possessed of larger means, who will not now stoop to compete with the former class. And here one important consideration must not be omitted. The engagements with the contractors are too indefinite, and the Government assumes the prerogative of determining doubtful points, to modify and draw back from disagreeable stipulations made, and to insist on new ones, and even to put a sudden stop to a contract without any compensation, not for default of the contractor, but merely because it does not think proper to proceed with the work. This circumstance alone is sufficient to account for the backwardness often of respectability to engage in Government contracts, and it must be altered if that consummation

Agreements must be strictly construed.

And equally as against both parties.

is desired. The specifications should be clear and definite on all points, as those in English contracts are, and the terms must be as strictly respected by the Government as they are required to be by the contractors.

Contracts may in time succeed better.

638. The contract system cannot be said to have been very successful hitherto even at the Presidency. Yet we are not of opinion that the attempt to carry it out should be abandoned. It certainly cannot be made the main reliance for the execution of work, but as an auxiliary means it may be very useful in supplying a test of the fairness of the charges in the Government Executive Department; and in the course of time a better order of Contractors may probably be brought into the field. At all events officers zealous in their duty will always be ready to have recourse to contracts in one form or another. With experienced officers and skilled subordinates, possessed of a knowledge of the charges for materials, and the cost of construction, the contract system will be gladly adopted as an aid in attaining truth and fairness; and the antagonistic feeling hitherto apparently prevailing will die off. In particular it appears to us that building materials, Bricks, Tiles, Chunan, may properly be obtained by a system of contracts with the actual producers of those articles. It is singular that this plan has never been tried at the Presidency. It appears to us calculated to work in a far more satisfactory manner than the existing system, described in a former part of this Report, of having one general supplier for materials and articles of all kinds.

Contracts in the Revenue Department.

639. Respecting the practicability and the utility of Contracts for work in the Revenue Department in the Interior, we made enquiry by circular addressed to Collectors and Civil Engineers, and we will state the result of those enquiries. It is necessary in the first place to observe that some species of work in the Provinces are and always have been performed on contract, and with satisfactory results. Thus all earth-work, whether in the way of excavations, embankments for tanks, canals, or road work, or in digging foundations for buildings, is almost universally done by contract; so also are all constructions of rough stone, viz. revetments, Calingalabs, Anicuts &c. There are particular castes or classes of persons who are met with in all parts of the country, whose special business it is to work either in earth or rough stone; their work even for private persons is always by contract at a certain quantity for a given sum, and the Market value of such labour is well ascertained.

Again in the case of buildings, it is common to contract for the supply of materials; brick-makers and lime burners contracting to supply the articles in which they respectively deal, at a fixed price, and at certain fixed times. In some cases, though less commonly, the wood-work of a building, i. e. the doors and windows, are furnished by contract.

Cases in which contracts may properly be employed.

640. Now in all the foregoing cases it will be seen that the work engaged for possesses the three following properties; 1st. It requires very little supervision while in progress; 2d. its quality can be tested with certainty by inspection after it is done, and 3rdly inferior work can be rectified, or bad materials rejected, without much trouble or cost. We are of opinion that all species of work in which these conditions are present may in general be properly contracted for but none in which they are absent. Further, contracts are improper where the work requires a species or a degree of skill which the Contractor cannot command; or where the contingencies of the engagement are large, so as to make it resemble a gambling speculation. And lastly we would observe that it is the universal testimony of all the officers in the Provinces from whom we have received replies, that none but such simple Contracts as we have described can there succeed, because people competent from skill, capital, and character, to undertake and fulfil mixed contracts, are not to be found.

Take for instance a building or a bridge. It is universally agreed by those officers who have made the trial, that a work under construction by contract requires fully as much, or even more close supervision on the part of the officers of Government, than one under their immediate charge; there is therefore no saving in that item. And even with careful supervision bad materials are not unfrequently used, and disputes and dissatisfaction follow. Then as to delay; it is found practically impossible to keep Contractors to their time; so that independently of the inconvenience of the delay itself, the amount of supervision is in fact much increased, as it is required for a longer period. Again as to a Contract for such a work as keeping a road or channel in repair. Here the work is uncertain in amount, depending much on weather. A storm or accident may do so much damage that the Contractor would be unable to repair it without ruin; or if not quite so bad, still the repair would be done tediously and in a slovenly way, and only under the influence of constant urging by the officers of Government.

641. On the 26th Decr. 1848, the Government expressed their desire that contracts should be resorted to in the case of works in the Revenue Department in all practicable cases; and the Honorable Court in a despatch of the 29th August 1849, expressed their approval of that order. That contracts, nevertheless, have not come generally into use for this class of works, is owing, we fully believe, to their unsuitability in the Provinces, from that absence of competition on both sides which we noticed above in our opening remarks on this subject, and which is found in the Interior in a higher degree than even at the Presidency. Every officer both in the Revenue and the Engineer Departments gives an opinion adverse to the use of Contracts, except in cases such as those described above, in which they are found convenient and useful. The Collector of Coimbatore indeed notices some instances in which they have succeeded in the case of Buildings on the Neilgherry Hills, and thinks them generally applicable there. But this is an exception which proves the rule, for the circumstances of the Neilgherry stations resemble those of Madras much more than they resemble those of upcountry stations generally. With this exception, so to call it, all the officers state that competent contractors are not to be found; and that in those cases in which contracts for buildings &c. have been given, the work has required much more close inspection than work done in the usual way, and has at last only been completed after very long delay. Several of them add their opinion that if competent persons could be found, the contract system might be introduced with benefit. In these sentiments we generally concur; though we think that even in the supply of materials, especially when expedition is of importance, contracts will often be improper. When the quantity of bricks or of lime required is large, an intelligent Overseer will save much more than his pay in providing them under his own superintendence, and with respect to delay, the instance of the Bridge built near Chingleput in 1850 is an example of what occurs not uncommonly. Contracts had been made with parties to furnish the bricks required amounting to a very large number. The bricks were not supplied as agreed for, and the Civil Engineer who was superintending the work, had to set to work in June to make bricks himself, and without any delay as the monsoon was approaching. This was effected under the superintendence of a very active Overseer, the bricks were produced considerably under the contract rate, and the bridge was completed before the Monsoon. Suits were filed, and we believe are still pending in the Civil Court, for the recovery of the cash advanced to the Brick Contractors.

They are unsuitable generally for other works.

642. Before closing this Report we think it expedient to offer a few concluding remarks on one part of the scheme which we have proposed for the future conduct of the Public Works Department, being that part of it which appears likely to be received with most variety of opinion; we allude to our recommendation of a Board for the control of the Department, in preference to an individual officer. In order to illustrate our idea of the use of a Board we will briefly define the duties which in our opinion ought to be performed by it. The functions of the Government we conceive to be those of general control over all branches of the administration. It cannot direct the business of any one branch in detail; but can only appoint the general course of proceeding, devolving on the subordinate authorities the task of carrying out such general views, reviewing the operations of those authorities at certain fixed times, and deciding on appeals from their orders in particular cases.

A Board for Public Works.

The business of each branch or department of the administration, and this is specially true of that of Public Works naturally divides itself into two parts; First, that of deliberation, including not merely the discussion and decision of particular cases of importance, but also the generalizing of the less important cases into classes, and providing rules for the guidance of the lower officers; and second, that of execution, making enquiries and collecting information on which the higher authority may decide, and carrying its orders into effect. Of these two divisions of duties, those of the latter can only be properly performed by individuals; they require promptitude, which is the characteristic of individual action. But the chief function exercised in the effective performances of the former is deliberation, and we are supported by the general experience of all ages and countries, in arguing that this is rather the part of collective bodies than of individuals.

The natural division of the business of administration.

643. It is alleged that a Board must be dilatory. But while we fully admit that this quality is found in many Boards, we believe that in every case it is traceable to a want of attention to the natural distribution of duties above detailed. Either the Board, instead of confining itself to its proper function of deliberating, and of laying down general rules and watching and enforcing their observance, has assumed a part of the duties of the local executive authorities,

If that is neglected embarrassment and delay will ensue.

or the Government, stepping out of its true position of general control over all Departments, has interfered in the particular duties which belong to the departmental Board.

A Board should never interfere in the management of routine details; it should issue general orders and lay down rules to be carried into effect by its local agents, and it should decide on those more important cases which may properly be reserved for it. If, forgetting this, it assumes the executive and detailed duties which can only be rightly performed by the local officers, it must become hampered, because it cannot have the means of really deciding on such minor matters; long and unsatisfactory correspondence follows, and delay and embarrassment are the result. Again, if the Government, not content with performing its proper duties of general control, the laying down general rules, and periodically reviewing the observance of them, intrudes into the interior administration of any Department; the controlling head of that Department, having its authority thus interfered with becomes paralyzed, and confusion and delay must follow.

Such has been the case at Madras.

644. Now there has long been a strong tendency on the part of authorities of all grades in this Presidency to encroach on the functions of authorities below them. The Government has encroached on the Boards, and the Boards have encroached on the local Officers. We need not give instances in proof of this assertion, every one familiar with the course of business at this Presidency will feel it to be true. It is matter of daily remark and conversation that the Boards are powerless by reason of the habitual and constant interference of the Government in the details of their business, and the invariable censure which they incur if they exert any but the most routine powers. And this jealous concentration of authority does not stop here, it extends to the officers in the Provinces; who instead of being furnished with general rules, and vested with power and latitude of action commensurate with their nominal position, are required to submit multitudes of individual cases of trivial importance for the special orders of the Board of the Department, or those of the Government to be obtained through that Board. The consequence of this absence of organization of duties and division of labour is that on the one hand responsibility becomes a name, because every functionary can shelter himself under the orders of his superior, or under the plea of want of power; and on the other, that there is a universal complaint that the Officers at the Presidency, up to the Government itself, are overwhelmed with detail, and unable to give attention to their proper duties. And while they are thus overloaded with unimportant work, which would be better done by the subordinate authorities, great questions of administrative and social improvement remain neglected.

Additional causes of failure in the Department of Public Works.

645. The foregoing remarks are designed to explain why the actual working of Boards here cannot be confidently appealed to in support of our opinion in their favour. And as respects the Department of Public Works there are still further and more particular reasons. Nominally the Revenue Department of Public Works has been under the control of a Board, the Board of Revenue. But that Board was originally constituted for another and different object, the control of the detailed and intricate systems of Revenue administration. And the duties connected with that object, performed in the mode above described, have ever afforded full occupation to the members. The charge of the Public Works was imposed on men thus already provided with full employment, and able to spare but very little attention to this new duty. A second special cause is that the local agency at the command of the Board in this Department has ever been utterly inadequate, and in great measure incompetent. On this point we need not here enlarge; it is sufficient to refer to what has been said in this Report, as to the executive agency in the Revenue Department of Public Works, and in our First Report as to the deficiency in the numbers both of the Civil Engineer's Department, and of the Maistries. The Board have not failed to make those deficiencies known to the Government; and they have been admitted, but not remedied.

As to the Board which has directed the Military Branch of the Department it has been encumbered with details, and has been restricted and interfered with by Government, in a far greater degree than the Revenue Board; and it also has been very inadequately provided with local agents.

We have guarded against such mistakes.

646. In sketching out our idea of a Board for the Department of Public Works we have endeavoured to avoid all these sources of disability. We have proposed a Board free from other avocations, specially for the control of Public Works of all descriptions. We have drawn a broad line between deliberative and executive functions; assigning the whole of the latter to the local officers; and confining the Board to the former, to those duties which they can perform really and not merely nominally. We have put aside that jealousy which withholds confidence from local offi-

cers, and have proposed to trust them largely under general rules, to act independently in the performance of duties requiring promptitude of action, and which depend on local knowledge; and we have provided at the same time for their rendering a prompt and full account of their exercise of these powers. As respects the Government, our plan confines it to the position of general control, and provides for the performance by the Board of Public Works of all duties involved in the management of the Department under the general instructions of the Government; their orders being subject to the confirmation of Government in a few special cases. And here too we have provided for a full annual review by the Government of the operations of the Board under the powers confided to them. Lastly, we have proposed to remedy that want which has always acted so injuriously on the efficiency of the Department, viz. the absence of qualified agents. It can hardly be made a reproach to even the present imperfect system of control and superintendence, to have failed, with means so exceedingly deficient as to both extent and quality. We have proposed an Establishment sufficient, though not more than sufficient, for the right performance of all local duties. We have also in the budget and Balance sheet, provided for a far more complete and searching control over the expenditure both prospective and actual, than has ever been within the reach of Government hitherto.

647. We advocate a Board rather than an individual for the post of controlling head of the Public Works Department chiefly from its superiority for the function of deliberation, to which the duties of the head of the Department ought to be confined. Three or four men sitting in a Board do not simply surrender each a portion of his opinion in order to meet those of his colleagues; such compromise might sometimes be an evil rather than a good. But the discussions in such bodies, the hearing and weighing opinions different from their own, lead the members, where men of sense and candour, to think; and thus new points of view are taken, new ideas are eliminated, and opinions are not simply rounded off, but are matured, to a degree rarely if ever attainable by the unaided reflection of an individual mind. Nor need the members of the Board be without the means of making known their individual sentiments in cases where the opinions of a minority may differ from that of the majority. The right to record minutes, and to send them up to Government when the resolution of the Board on the case goes up, will secure to the Government the advantage of hearing both sides of the question; and we are decidedly of opinion that for the sake of truth and justice, and as a valuable aid to the Government in judging, this right ought to be vested in the members.

The advantages of a Board for deliberation.

648. And our conviction in favor of a Board is confirmed by a consideration of the magnitude of the duties to be laid on the head of the Public Works Department. Here is a country of 165,000 square miles (including Mysore) almost entirely without the means of internal communication. Those means have to be supplied; and the work of deciding on the lines to be taken, and on the species of communication to be selected for each, the control of all the preliminary enquiries, and of the execution of the projects, will devolve on the head of the Department. Again there are the Irrigation works of the same country containing 70 or 80 millions of culturable acres, a large proportion of which extent is capable of being fertilized by a supply of water; and immense volumes of water now annually running to waste in the ocean, are ready to be turned upon the land. There is the drainage of vast areas now subject from the want of the necessary works, to destructive floods; the improvement of the River Navigation and of the Ports, with the provision and maintenance of Piers, Harbours, Beacons and Light Houses, on 1500 miles of coast; and lastly, are the Barracks, Buildings, and Fortifications, of a Military Force of 70,000 men. In England the superintendence of works of all these various kinds employs numbers of separate and independent Boards; but in this country private enterprise is as yet too backward to undertake more than an extremely small portion of them. Vast as they are, we believe that confining itself strictly to its proper duty, and aided by competent local officers in sufficient numbers, the duties of direction and control may be performed by a single Board. But the labour will be far too laborious and extensive for any one individual to accomplish, and it is our full belief that the attempt to carry out such a system could not fail to end in signal disappointment, however distinguished and varied might be the ability of the Officer selected.

The magnitude of the duties to be performed.

649. Another advantage of a Board is its continuity as distinguished from an individual. In this country from various causes, changes in the tenure of office are of constant occurrence, and when such a change takes place in the case of an individual officer, a complete break occurs in the objects pursued and the mode of pursuing them. It seems particularly inadvisable to admit

The continuity of a Board.

such breaks into the administration of any branch of the Government, and this is avoided by having a Board of several individuals. A Board from its very nature has a peculiar faculty of retaining uniformity of sentiment and of action. This, it is true, is not an unmixed good, because as a consequence, if a bad system once becomes established in a Board it is difficult to eradicate. But this is the worst view: a Board preserves good as well as evil, and if the selection of Members be only moderately judicious, there is no doubt that the good will preponderate. In the case before us in particular, if the new Board is carefully constituted at first, and as a consequence a good system is established in it, it will perpetuate that good even through a succession of injudicious nominations; while if the succeeding appointments are good instead of bad, it will go on continually improving.

A Board will have weight in advising the Government.

650. And there is still another circumstance of very great importance in this question, viz. the weight and authority of a Board in advising the Government as compared with that of an individual officer.

The Government is composed of gentlemen who how highly qualified so ever for their exalted position, have not necessarily, and often have not at all as a fact, gone through any training whatever to fit them for pronouncing on any of the various questions which must arise in the administration of the extensive Department of Public Works. That Department is only one out of many to which they have to give their attention; and any high degree of familiarity with that, would generally involve a want of acquaintance with others, with which it is more important that they should be familiar. At all events, as a fact, the majority of the members of the Government have ever been and must continue to be unqualified to pronounce an opinion on any other than the most general questions connected with Engineering works. It therefore seems to us necessary for the good of the Public Service that they should be provided with advisers competent in the possession of the particular knowledge required, and in such a position as to be listened to with deference on subjects connected with their particular duties.

Example: the late rules proposed by Government for the Maraimut Department.

651. We do not desire to dwell on this subject, and our remarks shall be brief. Our proposition is, 1st, that the Department of Public Works ought to be under a separate authority, holding such a position as to be able to advise the government with weight and effect; and, 2nd, that a single officer cannot do this so well as a Board; and we will content ourselves with giving one example of recent occurrence, to support each part of it. In the beginning of 1851 the Government drew up a set of additional rules for the guidance of the Revenue branch of the Public Works Department. They were prepared by the Government without consultation with any other authority or Department; and having been completed, and finally approved, they were sent down to the Public Works Department of the Board of Revenue not for their opinion or criticism, but to be immediately carried into effect. The Board, however, being of opinion that their operation would be most prejudicial, felt it to be their duty, before putting them in force, to submit their objections to them; and the Government then forbore to press their enforcement, and sent them to us for our remarks. We recorded our views upon them in the latter part of the first Section of our first report. After careful and detailed consideration, we could not but pronounce our decided conviction, that some of them were impracticable, and conformity to them impossible; that others were inapplicable, inexpedient, and unnecessary; that others again would diminish even the existing efficiency of control, and increase frauds; and that the tendency of the whole was to stop improvement. Thus our opinion of the new rules fully coincided with that of the controlling authority at the head of the Department; and further, we have no hesitation in declaring our belief that there is not a single Officer practically acquainted with the working of the Revenue branch of the Public Works Department, whether from among the Engineers or the Revenue Officers, who would not condemn the rules as tending powerfully to aggravate all its evils. Yet these rules were brought out by the Government as a great improvement; and this single fact seems to us sufficient to prove that the Government is not competent to interfere with advantage in the immediate direction or control of the Public Works Department.

Another example: the Road Department.

652. In support of the second part of our proposition we will take the instance of the Superintendent of Roads. The Road Department was constituted for the maintenance and improvement of the main lines of communication throughout the country. Great things were expected from it, and a special fund of four lacks a year was set apart for its expenditure; the powers assigned to the Superintendent were very great; and, under the idea of enabling him to act more promptly and vigorously, he was placed in direct correspondence with the Government, receiving his instructions from them alone, without the intervention of any other body. In our first

Report (Section III) we traced the history of the Department; we need not repeat it here, but will only say that this last feature in its constitution, which was ostensibly designed for its greater efficiency, has been the most powerful cause of its failure. The official position and standing of the Superintendent were not such as to give his opinions weight with the Government, and his views and recommendations were constantly set at naught by them. The selection of the first Superintendent was peculiarly happy; of high professional reputation, of single minded devotion to the Public Service, and of unwearied activity and industry, Captain Best appeared to possess all the qualities suited to fit him for the work assigned him, and to entitle him to the confidence of the Government. But all those qualities went for nothing. Almost from the first he was treated as if he knew nothing of his duties. His propositions for the organization of the Department were rejected; his representations were disregarded; and eventually he was severely and repeatedly censured for the unsuccess of the Department, brought about as that was by arrangements enforced by the Government in spite of his opposition.

653. This instance taken in conjunction with the preceding one, seems to us to prove conclusively that the head of the Public Works Department ought to be in a position to advise the Government with authority. Had the new Maraimut rules been opposed by no more weighty body than the Superintendent of Roads, the opposition would probably have been overruled, and the rules been enforced; and perhaps the officer who vainly opposed them would afterwards have been blamed for their disastrous results. On the other hand had Captain Best had the weight of the Board of Revenue to support him in his representations to Government, they would most probably have prevailed; and the Road Department in spite of the defects of its original constitution, might have become capable of fulfilling in some degree the high expectations formed of it.

654. In the foregoing paragraphs we have supposed that some one authority will be vested with the control of the Public Works Department; but it is perhaps possible that in consideration of the magnitude of the work, it may be proposed to divide the burden by assigning portions of the country to different and independent officers each directly under the Government. We must be permitted to say that the plan supposed would in our opinion be far worse than that of a single controlling officer.

It appears to us essential to the right conduct of the Department of Public Works, pre-eminently even above other Departments, that it should be under one central control, subordinate to the Government. Such controlling authority, and especially if it be a Board, is of very great value in ripening business for decision and in generalizing and digesting the ideas and suggestions of local officers. It must be observed also that without such central departmental authority, that regular organization and in particular that uniformity and system in the accounts, which seem so important, and the clear and direct control over the expenditure thus placed in the hands of Government, must be wanting. No one will deny that so large a Department numbering so many officers, extending over so large a country, and including so many species of operations, must need constant care and attention to preserve it in regular and harmonious action, and to guard against the subtle entry of abuses. But the Government, occupied with so many other duties, would be utterly incapable of this, for want of time even if otherwise qualified; and local Superintendents would neither possess the requisite influence, nor the necessary general view. It appears to us absolutely essential therefore to the efficient control of this important branch of the administration, that the Government should have the aid of a central departmental head, with jurisdiction geographically co-extensive with that of the Government itself, to direct it in all its parts on a uniform and harmonious plan, under a distinct responsibility.

655. Again, such local Superintendents as we are supposing could not have any weight in advising the Government. We have seen that even the Superintendent of Roads was unable to exercise any, though at the head of a separate Department, and possessing eminent personal qualifications; and much less would the officers in the case supposed, having charge each of only a Section of the whole Presidency, and all of them probably remote from the seat of Government, and thus both out of sight and without power to press their views, and out of the reach of those improving and enlarging influences and associations, which must distinguish a Presidency town from the Interior. In point of fact the Government would then be the Board of Public Works; and it would be far less competent to the charge than the Board of Revenue now is to control the Revenue branch of it; because its members would be less prepared for the task by previous train-

Conclusions from these two examples.

The plan of several independent Superintendents.

One central departmental control is necessary.

In the case supposed the Government would be the Board of Public Works.

ing; because the time they could devote to it would be much less, while the work to be done would be very much greater; and because it would be their responsibility.

not qualified to do so.

656. We have already pointed out that the natural functions of the Government being those of general control, its interference in the detailed arrangements or proceedings of any one Department must lead to obstruction both of the superior and inferior duties. And the past history of the Public Works administration at this Presidency supplies an example to show how little could be expected from the Government in directing and improving the action of that Department. Hitherto it has been divided into three separate branches, the Government being the common superior of all. The Government therefore has hitherto been the only authority in a position to take a general view of the Department, or to introduce general improvements; and even if it could not be fairly expected to originate such improvements, at least it might be supposed that beneficial changes adopted in any one branch of the Department would have been extended to the other branches. In fact, however, we see no evidence that such general or comprehensive view has ever been taken by the Government. We have had occasion to point out how little has been done to make the experience of any one of those branches available for the others; that different practice prevails in each on almost all points; and that where an improvement is introduced in one, which would be equally useful in the others, there is rarely any attempt to communicate it.

And it would not be so, even with an Engineer as a Secretary.

657. Nor would the case be improved if the Government had an Engineer Officer as Secretary in this Department; in some respects matters would then be worse. With such assistance the Government would have confidence to interfere on all points, and there would be no one able to speak out and correct them when they fell into errors. The local Superintendents would certainly not have influence to do so; and would probably rarely attempt to offer any objections. Even the Secretary's opinion would certainly be often disregarded; for he would be only a single individual like the Superintendent of Roads, and he would be in a position immediately subordinate to the Government. It is most likely, indeed, that he would not display much independence in advancing or maintaining opinions at variance with those of his immediate superiors. On one hand his advice would uniformly be met with respect, things would be no better; for in the absence of any independent and influential authority below, the Government would be without the means of testing his opinions by comparison with those of other competent persons. He would no doubt occasionally fall into mistakes and adopt erroneous views; but the Government would not be in a position to discover his errors, and even if detected they would certainly be viewed with leniency, as the Government would not like to be in a great measure identified with him.

Under such a system there would be no responsibility.

658. Thus under the proposed arrangement there would be an entire absence of responsibility on matters concerning the general management of the Department. The local Superintendents would have no power and therefore of necessity no responsibility; the Government Secretary would be virtually free from any check, because he would be sheltered under the sympathy and protection of the Government; and the Government would be entirely free from responsibility, because there would be no one who could notice mistakes. In other Departments it is found expedient to have at the head of each, one central authority, to exercise control over it throughout all parts of the Presidency, being itself directly responsible to the Government; and the Geographical extent of its operations being coterminous with that of the Government in that Department. This is the case with the Revenue, the administration of Justice, the Army, the Ordnance, the Commissariat, the Department of account, and others. It appears to us that it would be eminently unwise to depart from that course, one sanctioned by the common practice of all civilized states, in the case of the Public Works in particular; and to mix up the Government most in the details of that branch of the administration, with which of necessity it is the least acquainted.

Origin of the present Commission.

659. In closing our remarks on this subject, we may say a few words respecting the degree of attention reasonably due for their own sake, to the recommendations of such a Commission as ours. It is a very unusual thing for a commission to be nominated by orders from home, on any subject; and whenever such an event does occur, it is an indication that the subject in question is in a very unsatisfactory state, and that the efforts of the ordinary authorities have failed to produce amendment. That was certainly the case in the present instance; the Government had repeatedly for many years past expressed in very strong terms their dissatisfaction at the condition of the Public

Works Department in this Presidency; and a variety of remedies more or less comprehensive, and in many instances at variance with each other, had been proposed and submitted to the Honorable Court of Directors. The Court however were not satisfied with the proposed measures; and thought further investigation necessary into the nature and causes of the evils existing. In their Despatch of the 30th January 1859, in which they review at considerable length the various propositions for amending the working of the Public Works Department at all the Presidencies, the Honorable Court sum up their conclusions on the whole in the following terms. "Considering that the opinion of the Governor General has not yet been given on the division of Public Works in Bengal; considering also the unsatisfactory working of the system at Madras which formed the subject of our despatch to that Presidency, 29th May (No. 12) 1845, and the great differences of opinion in relation to the change of system at Bombay, the subject is not brought before us in a state for final decision; it is desirable that the entire question in relation to all the Presidencies should first pass under the deliberate review of your Government.

"In forming a judgment of the system of Superintendence, it is necessary to have a clear view of the actual state of all the work which is the subject of Superintendence; this, in the Districts, and especially in the District Roads, embraces a most extensive field of operations; the documents which we have examined exhibit many proofs of cost and labour thrown away, of work done over again and again without a good final result, of great excess of expenditure over estimates; in short, an extensive admission of defects, and a great diversity of opinion as to the mode in which those defects should be remedied.

"We think it desirable that you should select two or three competent officers from persons already at the Presidency, and whose services can be either wholly or partially spared for the purpose, to form a temporary Commission, to enquire into the whole subject of the Superintendence and execution of Public Works, not omitting any subject noticed in this despatch; that similar Commissions should be formed at the other Presidencies; that they should make full and detailed reports to their respective Governments, embodying such suggestions as may appear to them advisable; that those reports should be submitted to you, and that we should receive from you such a distinct opinion on the whole of the questions herein considered, as shall place it in our power to come to a decision respecting them."

660. Here then were admitted evils of long standing, perseveringly but vainly sought to be corrected by the ordinary authorities, and ultimately a commission specially appointed, because, from want of leisure or other cause, those authorities were not found capable of making the necessary investigation, and devising a remedy. The Commissioners were officers appointed by Government as competent to the task; they have devoted almost their whole time and attention for two and a half year to the varied and important subjects put before them, and they have made certain recommendations as the fruit of their researches and deliberations. We would be very far from claiming infallibility for those propositions; but, based as they are on the persevering and careful enquiries of officers specially selected by Government for the task, it appears to us that they carry with them a presumption in their favour, and that the *onus probandi* lies on those who object to them. Consistency seems to require that they should not be rejected unless clearly shown to be unsound, or unless something manifestly superior shall be tendered in their room. If the deliberate recommendations of such a Commission are set aside in favour of the schemes of any gentlemen, however high in rank, and however eminent in talents, who perhaps have never had an opportunity of observing the practical working of the existing system, and have been unable to bestow more time and attention on the enquiry than could be taken from the other engrossing avocations of the members of Government, it may truly be said that after all, the Honorable Court was under a mistake, and that the Commission was superfluous and unnecessary.

Some consideration is due to the recommendations of such a Commission.

661. To the reprint of our First Report, made by order of the House of Commons, were appended three minutes recorded on it by Members of the Government of Madras: in one of which we were affirmed to have misrepresented the views of Government through ignorance of the Records, and to have made representations at variance with fact; while in another the Report was characterized

Notice of the First Report.

as one sided, and not entitled to confidence. Thinking it due to our characters as Public Servants to endeavour to clear ourselves of the reflections conveyed in these terms, we addressed the Government through the Chief Secretary on the 10th September last, requesting to be made acquainted with the instances in which our Report was considered to be thus open to censure, so that we might be able to vindicate or explain them. We have not been favored with any reply to that letter; and we therefore deem it fitting briefly to notice the subject here, before closing our Second and final Report. In the absence of particulars in the charges made against us, we can only make a general disclaimer. We had no design to misrepresent the circumstances of the case, and we are unconscious of having done so. Our aim was simply to collect information from all authentic sources, so as to present the actual facts; and to state those facts plainly, together with the conclusions to which they seemed to lead. In the course of our investigation we examined the Records of the Public Offices most carefully; searching out every paper of which we got any trace, which appeared likely to bear on the subject of our enquiries, and not willingly leaving any source of useful information unexplored. We cannot hope that either our views or the expression of them are wholly free from imperfection or mistake; but we trust that the Government will yet be pleased to recognize the honesty of our design and the utility of our labours, and to make allowance for oversights into which we may possibly have fallen in the course of enquiries so extensive and so complicated.

(Signed) J. D. BOURDILLON.

MADRAS,
November 18, 1858.

G. BALFOUR, Major.

APPENDIX A.

Memorandum by Major Pears, C. B. Acting Member of the Military Board, dated February 16, 1850, regarding the Executive Department of Public Works.

The whole of the Officers (and their Subordinates) employed in the Department of Public Works, Civil Engineers, Assistant Overseers, &c., are considered as constituting in the first instance a Department of inspection. Indeed it is laid down among the fundamental rules of the Department that they are not personally to direct the execution of any works. They do so however of necessity occasionally.

2. When the greater number of the Engineer Officers were in 1838 placed at the disposal of the Revenue Board, the question probably arose whether they should take into their hands the actual execution by themselves or their Subordinates, of the Public Works, the Disbursement of money and all the details; or whether the executive being left much as before, the Engineer should be merely an Inspecting Officer; and the latter plan was adopted, it may be because their number was insufficient for the former.

3. I doubt, however, if the most judicious course was followed. I conceive that in the event of there not being a sufficient number of Officers to form a well organized Department, complete both in the executive and the superintending, the interests of Government would be best consulted by looking first to the former; getting a good executive at all events.

4. A good executive, or an Executive Department made up of good materials, may be trusted to work satisfactorily with comparatively insufficient Superintendence; but with a bad executive, the Inspecting body, to be effectual, must be co-extensive with the other.

5. In the Department of Public Works at present there would appear to be about thirty Officers employed, chiefly in the supervision of an Executive Department laying out not more than eight lacks of Rupees annually; the Officers themselves not directing the details of the works, or personally controlling the Disbursements, but inspecting or reporting upon Estimates and results.

6. By the present system the Collector stands at the head of the Executive Department, the local Officers, the Tahsildars, being his Agents. Works are for the most part executed under their orders, and the money disbursed by them.

7. Considering that these Officers are both Police and Revenue Authorities, that it is their duty to recommend works which they know it will be their duty to carry out; considering also the present character of the people of the country, such a system wrong as it appears on principles of universal application, seems necessarily attended with great evils in this country.

8. Instead of laying this additional charge upon an Officer so fully occupied as the Tahsildar is, instead of placing in his way a strong temptation to avail himself of the immunity which his position promises him, and to turn the expenditure of public money to personal account, it would seem far better that the executive duties should every where belong to a distinct Department; and that the Civil Authorities, instead of being mixed up with duties foreign to their proper profession, should be looked to rather as important checks upon the separate Department of Public Works.

9. There is much difficulty and inconvenience arising from the present system which constitutes the Engineer Officer a check upon the Collector and his Establishment. The Collector cannot fail in many cases to look to the public servants of his Establishment rather with reference to their character as Revenue Officers than as Engineers, and he will be disposed to consider any adverse criticism upon their proceedings, merely as a statement of opinion on the part of the Engineer, against that of the Tahsildar as one of fact.

10. If the whole of the Public Works were executed by men of the Public Works Department under the direction of Officers of the same, there would arise little difference of opinion and few discussions. An Overseer or Maistry serving under an Engineer Officer would feel that by the decision of his professional superiors he must stand or fall; and would be sufficiently well acquainted with the principles upon which that decision would be based, and the consequence of conviction to neglect his duty or to attempt to defraud the Government. There would be in fact more chance of discipline in the Department.

11. In every respect such a change would be advantageous to the Collector. Responsible for the discharge of his duties and the use of means at his disposal as a Revenue Officer, he would be no longer responsible for the maintenance, of a portion of those means, the works of irrigation;* and would be quite ready and in most cases able to watch and criticize the proceedings of those who were so.

12. I think therefore in addition to the advantages gained by uniting the whole of the Public Works under one authority, the introduction of a new system which should give to each Collectorate an executive Engineer would be attended with advantage to the Civil Department itself.

13. With regard to the "Roads" it appears that the present system is about the most expensive that could be devised. If there were a sufficient number of roads, and those of sufficient value, to justify a large outlay on their construction and repair, one might imagine an extensive Department in which every Officer would have as much work as he could look after within reach; but here, with a poor country and merely the skeleton of a system of roads, an Officer is appointed to the general direction of their making and repair, and a great portion of his time is necessarily spent in travelling, instead of having all his work within convenient reach. He has actually to travel several hundred miles and back, to direct the expenditure of a few thousand Rupees. He is moreover at present executive, inspecting, and it would appear, Auditor of his own accounts.

14. If the Head of the Road Department were a general Superintendent and projector, if his duties were to consider projects and reports, and to serve as a channel of communication between local Officers and Government, his position would be totally different from what it now is. But in that case such duties, strictly deliberative, might very well be thrown upon the Board of Public Works of which the Chief Engineer is Member; while the executive duties would be far more conveniently performed by the District Engineers.

15. In fact I believe that the most economical and in all respects the most judicious mode of employing Officers of Engineers in this country, would be to give to each one all the work in his own profession that could be found for him within given convenient limits; to place each Officer in charge of all Public Works within a certain circle, whether Civil, Military, Ecclesiastical or the Roads. As the country prospers and the expenditure increases, these circles would necessarily narrow, and more Officers would be required; but it is of special importance now, that the services of Officers should be distributed on the above principle; the expenditure of public money being so small in reference to the extent of country, and the ratio which the Superintendence bears to the expenditure consequently so great.

16. As far as the executive duties are concerned, there is no more reason why different Officers† in the same District should look after the roads, the tanks, and the barracks, (all duties of one profession,) than that there should be other in other Departments, as for the churches, the bridges, &c. or that the duties of Medical Officers should be divided not according to localities, Districts and Stations, but by diseases.

17. The Revenue Board gave an opinion adverse to the placing the Public Works under a separate Board, stating in an Extract from their proceedings on the 10th September 1838, para 6. "The Board watches over the Revenue, its assessment, and collection, and as the Revenue materially depends on the irrigation it ought to have always at its own command the means of ascertaining that the various sources of irrigation are kept in an efficient state, and that their improvement and extension keep pace with the increased prospects of the country, and that the public money is not wasted in useless ill judged projects" and again in the 7th para "when new works or improvements are proposed, their expediency must be determined by the effect they will have immediately on the prosperity of the country" and the Board added in the 9th para "they consider it essential that the authority reporting upon the expediency of a work should have an opportunity of seeing it carried out." If by "seeing it carried out" is meant being directly or indirectly concerned in the duty of carrying it out, I think the opinion above expressed is contrary to received opinion upon the subject as a question of general principle.

* He would be of course responsible that their need of repair was promptly brought to notice.

† Always excepting cases where they have a system of works to superintend sufficiently extensive to give employment to one or more Officers.

18. The mixing up of two functions is often advocated as convenient, but generally found to prove inconvenient in practice; and there is no other Department to which would be allowed the privilege, on which would be laid the responsibility, of seeing carried out its own recommendations in a line so foreign to its proper duties as the execution of Public Works is to those of a Revenue Officer. Moreover it appears to have been forgotten at the moment, that it is for a higher authority, the Government, to judge of the "expediency of new works or improvements;" and to enable it to form a sound judgment; to avoid expenditure upon useless ill judged works, it requires unbiased opinions from qualified persons upon two distinct points, the usefulness and probable results of the work when executed on the one hand, the plan to be followed and the probable cost on the other.

19. As matters now stand, by far the greater part of the money expended on Public Works in that Department (the "ordinary" works) is expended in anticipation of the opinion of the Revenue Board and sanction of Government. The existence of a separate Board of Works would in this case operate in nothing but in providing a body of Officers set apart and qualified to check such expenditure. The Occasional Estimates, on the other hand, are not acted upon until sanctioned by Government; would it not be an advantage that the Government should have a Board to which they might refer for the professional merits of the case, the Board of Revenue having given their views on the subject as one of Revenue.

20. In fact I think that these two duties cannot be kept too distinct. It is desirable that the Revenue Officer should be placed in such a position as not to give, if possible not to entertain, an opinion upon the professional merits of the question; at the same time it is not desirable that the Engineer's report should be influenced by his views upon the magnificent harvest to be reaped as the consequence of his project. Government require from the one a fair statement of anticipated results, from the other an impartial professional exhibition of the means and the cost of their attainment.

21. In originating a project no doubt the Officer, whether the one or the other, must touch on both these points, but in passing a judgment upon the same the more distinct the authorities to which it is submitted the better. The Engineer is not the proper man to call upon for the probable commercial and political effects of a railway; nor will the merchant or the statesman trust his own judgment in the selection of the lines or calculation of the cost.

22. The plan which I have, in my Minute of the 24th December 1849, laid before the Military Board, of having the greater part of the Officers employed as Executive Officers and a few as general supervisors over large circles, is that I believe followed in Bengal; and what is more to the purpose, it is a system founded upon reason and experience in every similar profession.

23. There are many advantages arising from the appointment of the inspecting Officers. They are personally acquainted with localities. They are relieved from the labor and the constant employment arising from the direction of details. Their opinion and suggestions founded upon personal observation must be of the greatest value to a Board of Works and to Government. They serve as a check over the less experienced Executive Officer, but at the same time they relieve him from frequent difficulty and much responsibility; and perhaps not the least of the advantage resulting from the appointment would be found in the degree to which their position would enable them to consider and mature projects for the improvement of the country, &c.

24. There is one other point connected with the construction of an efficient Department of Public Works which merits and will I doubt not receive consideration at the hands of Government; I allude to the systematic education of Maistries. Whether as promoting the cause of education by laying open a field for its encouragement and improvement, or whether as serving the interests of Government, providing in educated natives the most suitable and economical subordinate agents for this important branch of the public service, I should hope that the day is not far distant when the same assistance and encouragement now given to candidates for employment in the medical profession will be extended to students in Civil Engineering. I believe that if the natives of this part of India have a natural talent for one study or profession rather than another it is for Civil Engineering. I have generally found men, and especially young men, of that class, fully alive to the advantage of scientific acquirements, quick and anxious to learn; and I do not see why they might not be taught to perform and perform well, all that is now required of a Surveyor. But as they have commonly not the opportunity of acquiring any education, and as their practice is

desultory and more frequently dependent upon their own imperfect notions, than upon the immediate personal guidance of a superior, they display in general lamentable ignorance of the very first principles of Civil Engineering.

APPENDIX B.

Letter from F. N. Malby Esq. Collector of Ganara, to the Secretary to the Board of Revenue Port Saint George, dated November 12, 1850; on the subject of payments from the Talook Treasuries.

SIR,—I have the honor to acknowledge your Circular letter of the 27th ultimo, directing that it be a standing order that no sum however trifling, shall on any account be paid from the Talook Treasuries out of the collections, except in an emergent case, or in instances where I may have received special authority to discharge drafts drawn by Military or Civil Officers; and then only by a special order under the signature of myself, or in my absence of the Officer in charge of the District.

2. The strict enforcement of this order will be attended with such serious inconvenience, and will so much disturb the arrangements which have been made in this District and which have proved in so many respects highly advantageous, that I beg to lay before the Board the following instances in which I trust that the present practice may be allowed to continue.

3. I. Large remittances are made to Bombay by money paid in the Treasury there for bills on this Collectorate. These are presented at my office, but it is often convenient to the parties to receive the money in one of the Talooks or at the subordinate Treasury at Honore. It has hitherto been the practice to give an order on the Talooks, that is if the collections in the Talook are sufficient to meet it; no money is allowed to be retained for this purpose.

4. The practice is as advantageous to the Government as it is to the Merchants. The bill is considered as cashed at the Treasury, and the money is entered as paid into the Treasury in exchange for an order on the Talook. The amount is thus remitted to the Treasury free of expense to Government, and the Merchant is saved the risk and delay of sending bags of Rupees a distance of perhaps 150 miles. Trade is improved, and our local remittances and those to Bombay are aided, by conceding this advantage to the Merchants.

5. II. In the same way it has been the practice to allow the parties to pay cash into the Huzoor Treasury, and to receive orders on the Talooks. This is an equal saving of local remittances, and is only allowed when there is money to be remitted; none is retained for the purpose. Printed advices are sent to the Talooks, and the practice is in every respect advantageous. It aids our local trade, hastens the remittances, and I have had occasion to quote it as one of the means by which the temptation to crime is diminished in this District.

6. III. The pay of the Talook Establishments has hitherto been paid by orders on the local Treasuries. They average about 40,000 Rupees a month; and the greatest inconvenience will be experienced if this sum is brought down every month, and sent back in every direction, (through the Sloopah Jungles for instance,) and the delay will be very seriously felt by the public servants.

7. IV. It has been usual in the execution of Public Works to give to the Tahsildars orders on their own Treasuries. It will be most inconvenient to remit Cash from the Huzoor to remote parts of this District. In addition to this it will lead to increased balances in the Tahsildar's hands; for it will be necessary in order to prevent the suspension of the work, that large sums should be sent whenever a remittance takes place, whereas now the Tahsildar is only permitted to take the sum actually necessary.

8. V. The Paymasters' drafts amount to about 27,000 Rupees a month, payable at five several Stations. These have been made payable under a standing order at those Stations, and this practice has proved most convenient.

9. VI. The Covenanted Revenue Officers at a distance from Mangalore, have been permitted to draw their pay in their own Talooks, giving at the same time an order to the Treasurer to pay the amount into the Huzoor Treasury.

10. I can safely say that these arrangements are of advantage to the service of Government. They expedite the public service, they assist trade, they render property more secure, and they save the services of a vast number of peons, who must otherwise be constantly employed in conveying money all over the country. The Board will judge of the difficulty that will be experienced in sending money from this to Hullah for the roads to be constructed there, or for the Sub Collector's pay or the Engineer Officer's allowances. It is a month's march. If it be remarked that it may be sent from the Subordinate Treasury at Honore, I beg to observe that there is far less risk to me in giving an order direct on the Talook.

11. I therefore earnestly trust that in this District the cases I have mentioned may be considered as emergent, and that I may be authorized to continue the practice hitherto prevailing, and which has never proved any thing but advantageous.

12. I also find that there are many other payments occasionally made in the Talooks which it would be impossible to stop suddenly without giving rise to great inconvenience. It has been usual to pay them from the deposits in the Tahsildar's Cutcherries. They are such as petty sums for the carriage of tobacco, for stationery, for the carriage of dusters, for rewards for killing wild beasts, &c. &c. Regarding the latter I beg particularly to remark that unless they are paid promptly, and in the presence of the European Officer, half their value to the poor villagers is lost.

13. While endeavouring therefore to carry out the order of Government as far as I possibly can, I have found it necessary to place the sum of Rupees 300 at the disposal of each Tahsildar, of the Sub Division Sheristadar, and of the Head Moonshee of the additional Sub Collector's Establishment. This, if approved of by the Government, will render it practicable to forbid the Tahsildars to draw any sums from the collections or deposits in their hands without express orders from myself. This will effect a considerable improvement in our accounts, for it is desirable that the deposits and the collections should be equally unexpended except for their legitimate object.

14. To this measure I have to request the sanction of Government, and I am compelled to state that without some such measure I do not see how the order of Government can be strictly adhered to, and the service of Government carried on in this District.

15. On these two several heads I have the honor to request the instructions of the Board of Revenue.

APPENDIX C.

Letter from Military Board Calcutta, to Military Board Madras, dated 22d June, 1852; as to the mode of sanctioning Estimates for Repairs, and Bills for work done.

I am directed by the Military Board to acknowledge the receipt of your letter, No. 3305, dated the 1st current, and to submit the following replies to the questions put.

Query 1st.—In the case of works in the Engineer Department executed on Government sanctioned Estimates, are bills which do not exceed their Estimates, or only slightly so, and to about what extent, passed by your Board without further reference to Government; and if so under what authority?

Answer.—Estimates for new works in the Engineer Department are without exception submitted to Government for sanction. The Bills for the same, if less in amount than the authorized Estimate, or not exceeding the Estimate by more than 5 per cent., are passed by the Board, under the orders cited in the margin,* of which copies are annexed; and are sent to the office of the Accountant Military Department for adjustment. Bills if more than 5 per cent., in excess of the Estimates, are submitted to Government for orders. Estimates for repairs in the Engineer Department are disposed of in the same way as Estimates for repairs in other Departments, see reply to 4th question.

* G. O. G. 17th July, 1819, Secy. to Govt. Mily. Dept. Letter No. 9, dated 14th March 1842.

Query 2.—If Bills are so passed, to whom do the Board report the transaction?

Answer.—A Quarterly Report is made to Government of Bills passed by the Board in excess of Estimates, under the order noted in the margin.†

Query 3.—Is any notification made to the Accountant General of Bills having been passed by the Board?

Answer.—When Bills are audited by the Board they are sent for adjustment to the respective Offices of Account. The Board make no further report, beyond informing these Offices that the Bills have been passed.

Query 4.—Are ordinary repairs executed without the sanction of Government, and are Bills of this nature passed by your Board without reference to Government?

Answer.—Ordinary repairs are executed without requiring the sanction of Government; the bills are also passed by the Board without reference to Government.

Ordinary repairs in this Presidency are classed under two heads; *Ordinary annual*, and *Ordinary petty or Contingent*. With regard to the former, at the commencement of the working season, Government places at the Board's disposal, on application, an advance equal to the average expenditure of three years, to enable the Board to order advances on the passed Estimates for the usual annual and quadrennial repairs; the office of Account granting the requisite assignments on the orders of the Board. Petty repairs are usually charged in monthly current expense bills and are executed from advances granted separately by Government.

Extract from the Proceedings of the Right Honorable the Governor General in Council in the General Department, under date the 12th January, 1830, No. 265, referred to in the foregoing letter.

Read an Extract from the Proceedings of Government in the Military Department dated 1st Instant.

Resolution.—The Governor General in Council sees no objection whatever to the arrangement adopted in the Military Department being acted upon also in the General, Commercial, and other Departments. But it will be necessary that Registers or notices of the bills passed in each Department should be submitted periodically, for entry on the Proceedings of Government and for notice in the General letters addressed to the Honorable the Court of Directors.

Extract of G. O. dated 17th July, 1819, referred to in the foregoing letter.

9. When the repair or erection of any particular building shall have been completed, the Executive Officer is to send a bill for the same, through the Superintendent, to the Military Board for audit; and if the amount of the bill does not exceed the Estimate, the Board is authorized to pass it without reference to Government.

Extract from the Resolution of the Supreme Government, dated 14th March, 1842, referred to in the foregoing letter.

In modification of the resolution in the General Department, dated the 12th January, 1830, His Lordship is further pleased to determine that 5 per cent. shall be the limit in future, instead of 10 per cent., up to which expenditure in excess of estimated cost may be passed by the Military Board, when such excess is satisfactorily accounted for to that authority.

† Government Order Military Department dated 12th January 1830.

APPENDIX D, 1.

Specimen Estimate for a New Work of Irrigation; such as it is proposed shall be sent up to the controlling authorities.

(REVENUE DEPARTMENT)

(NEW WORK)

IRRIGATION.*

ESTIMATE NO. 1 OF 1853-54.

DISTRICT—NORTH ARCOT,

Talook, Chittoor. Village, Bommasamoodrum.

WORK. RESTORATION OF THE LARGE TANK NOW IN RUINS.

Quantities.	DESCRIPTION OF WORK.	Rate.	Amount.	Amount of each part.
C. yds.	Earth Work.	Rs. A. P.	Rupces.	Rupces.
31911	Repairing bank and filling breaches at.....	0 1 6	2,992	
5376	Clearing Sand out of bottom of breach at.....	0 0 9	252	
	Total for the Earth work.....			3,244
	Stone Revetment.			
1170	Old Stone at.....	0 6 0	439	
96	New do. at.....	3 0 0	288	
1138	New and old do. at.....	1 11 0	1,920	
	Total for the Revetment.....			2,647
	New Calingalah.			
427	Brick in Chunam at.....	2 8 0	1,068	
	34 Upright Stones at.....	3 0 0	102	
3689	Excavating foundation of the Calingalah, and Channel to it.....	0 1 0	231	
	Total for the Calingalah.....			1,401
	Total Estimate.....			7,292

BOMMASAMOODRUM,

2d May 1853.

(Signed) A. B.

District Engineer.

* The headings to this and to all the following Specimen Estimates have been carefully framed so as to guide the proper department in classing the expenditure under the proper heads. The headings of the bills will correspond. The arrangement of the several terms of the heading is that which appears the best to catch the eye immediately; the docket should be the same.

APPENDIX D, 2.

Specimen Detailed Working Estimate for the same work as the foregoing; such as it is proposed shall be not sent up, but retained by the District Engineer for the guidance of the Officer executing the work.

(REVENUE DEPARTMENT)

(NEW WORK)

IRRIGATION.*

DETAILED WORKING ESTIMATE, No. 1 OF 1853-54.

DISTRICT—NORTH ARCOT.

Talook, Chittoor. Village, Bommasamoodrum.

WORK. RESTORATION OF THE LARGE TANK NOW IN RUINS.

PARTICULARS OF WORK.	MEASUREMENT, IN YARDS AND ANNAS.			
	Length.	Breadth.	Height.	Cubical Contents.
<i>Earth work to the Bank.</i>				
✓ Raising.....	60-0	8-0	2-8	1200-0
Do.	44-0	11-0	4-0	1936-0
Do.	18-0	8-0	2-8	360-0
✓ Widening.....	18-0	3-0	3-0	162-0
Raising.....	116-0	5-0	1-0	580-0
Do.	170-0	5-0	1-0	850-0
Do.	34-0	19-0	8-0	5168-0
Do.	4-0	5-0	1-0	20-0
Do.	20-0	7-8	2-4	337-8
Widening.....	20-0	2-0	3-0	120-0
Raising.....	56-0	5-0	1-0	280-0
Widening.....	56-0	2-0	3-0	336-0
✓ Filling breach below.....	50-0	40-0	2-0	4000-0
Raising bank.....	50-0	27-0	12-0	16200-0
Do.	20-0	5-0	1-0	100-0
Do.	20-0	8-0	1-8	240-0
Do.	3-0	4-0	1-12	21-0
Total Earth to the bank C. yds.....				31910-8
✓ Clearing Sand out of bottom of breach.....	48-0	56-0	2-0	5376-0
Total. Earth C. yds.....				5376-0
<i>Revetment to Bank.</i>				
✓ New half dressed Stone.....	16-0	1-0	1-0	16-0
✓ Old Stone.....	16-0	1-0	1-8	24-0
Do. do.	20-0	1-0	1-8	30-0
Do. do.	60-0	1-0	2-0	120-0
Do. do.	44-0	1-0	3-0	132-0
Do. do.	18-0	1-0	2-8	45-0
Do. do.	116-0	1-0	2-8	290-0
Do. do.	170-0	1-0	2-0	340-0
New half dressed Stone.....	30-0	1-0	2-0	60-0
Old Stone.....	10-0	1-0	1-0	10-0
Do. do.	16-0	1-0	1-8	24-0
Do. do.	58-0	1-0	1-8	87-0
✓ New half dressed and old Stone.....	50-0	1-12	13-0	1137-8
Old Stone.....	20-0	1-0	1-0	20-0
Do. do.	28-0	1-0	1-0	28-0

* See note to Appendix D, 1.

PARTICULARS OF WORK.	MEASUREMENT, IN YARDS AND ANNAS.			
	Length.	Breadth.	Height.	Cubical Contents.
Old Stone.....	20-0	1-0	1-0	20-0
New half dressed Stone.....	10-0	1-0	2-0	20-0
Total.....				1170-0
Old Stone cubic yards.....				96-0
New half dressed Stone revetment cubic yards.....				1137-8
Old and New half dressed Stone, cubic yards, New Calingalah.....				
Body.....	33-0	1-10	2-0	107-4
Heir retaining Wall.....	35-0	1-0	2-5	80-15
Apron.....	34-0	4-12	0-12	121-2
Foundation to Wings.....	27-0	1-8	2-0	81-0
Wings above.....	27-0	0-12	2-0	40-8
Deduct for Upright Stones.....				430-13
Cubic yards of brick in chunam.....				3-12
34 Upright Stones, each.....				427-1
Excavating Channel towards Calingalah and foundation.....				
34-0 50-0 0-12				3268-2
35-0 1-0 2-4				136-0
28-0 1-4 2-4				127-8
Cubic yards of earth work.....				78-12
Total.....				78-12
Cubic yards of earth work.....				3689-2

ABSTRACT.

Quantities.	DESCRIPTION OF WORK.	Rate.	Amount.	Amount of each part.
C. yds.	<i>Earth Work.</i>	Rs. A. P.	Rupees.	Rupees.
31911	Repairing bank and filling breaches at.....	0 1 6	2,992	
5376	Clearing Sand out of bottom of breach at.....	0 0 9	252	
	Total for the Earth work.....			3,244
	<i>Stone Revetment.</i>			
1170	Old Stone at.....	0 6 0	439	
96	New do. at.....	3 0 0	288	
1137	New and old do. at.....	1 11 0	1,920	
	Total for the Revetment.....			2,647
	<i>New Calingalah.</i>			
427	Brick in chunam at.....	2 8 0	1,068	
3689	34 Upright stones at.....	3 0 0	102	
	Excavating foundation of the Calingalah, and channel to it.....	0 1 0	231	
	Total for the Calingalah.....			1,401
	Total Estimate.....			7,292

BOMMASAMOODRUM, }

2d May 1853. }

(Signed) A. A.

District Engineer.

APPENDIX E 1.

Specimen Estimate for a New Road; such as it is proposed shall be sent up to the Controlling Authorities.

(GENERAL DEPARTMENT)

(NEW WORK)

PUBLIC ROADS.*

ESTIMATE, NO. 1 OF 1853-54.

ROAD.—No. 5, TRUNK ROAD.

DISTRICT—COIMBATORE.

WORK. CONSTRUCTING ROAD FROM COIMBATORE TO WALIAHUR, 15M. 4F. 146YDS.

Quantities.	DESCRIPTION OF WORK.	Rate.	Amount.	Amount for each part.
C. yds.		Rs. A. P.	Rupces.	Rupces.
74360	Earth work at.....	0 1 0	0	4,683
	<i>Metalling.</i>			
7646	At.....	0 4 6	2,160	
1699	At.....	0 7 0	743	
				2,893
913	Removing rock.....	0 4 0	0	228
	<i>Rough Stone Work.</i>			
182	12 Road dams.....	1 8 6	273	
223	3 Revetments.....	1 8 0	334	
				607
	Clearing Forest 2 Miles, 3 Furlongs long by 86 yards wide, 62 Canals.....	20 0 0	0	1,940
	14 Mile Stones.....	3 6 0	0	49
	<i>Bridge of 1 arch of five yards span.</i>			
189	Brickwork in Chunam.....	2 10 0	496	
208	Sqr. yds. plastering in Chunam.....	0 2 6	33	
305	Earthwork.....	0 1 6	37	
	Centrings.....	0 0 0	100	
	Baling and temporary dams.....	0 0 0	20	
	Sundries at 5 per cent.....	0 0 0	25	
				725
	<i>Bridge of 1 arch of four yards span.</i>			
204	Brickwork in Chunam.....	2 10 0	535	
157	Sqr. yds. plastering in Chunam.....	0 2 6	25	
624	Earthwork.....	0 1 6	56	
	Centrings.....	0 0 0	60	
	Baling and temporary dams.....	0 0 0	30	
	Sundries at 5 per cent.....	0 0 0	30	
				739
	Carried forward.....			10,964

* See Note to Appendix D, 1.

APPENDIX E 1. (Continued.)

Quantities.	DESCRIPTION OF WORK.	Rates.	Amount.	Amount for each part.
C. yds.		Rs. A. P.	Rupces.	Rupces.
	Brought forward.....			10,964
	<i>Four Tunnels each of 1 vent of one yard.</i>			
47	Brickwork in Chunam.....	2 9 0	120	
84	Sqr. yds. plastering in Chunam.....	0 2 6	13	
119	Earthwork.....	0 1 6	11	
	Centrings.....	0 0 0	15	
	Sundries at 5 per cent.....	0 0 0	8	
				167
	<i>For one Tunnel.....</i>			
	<i>For four Tunnels.....</i>			663
	<i>One Tunnel of 3 vents of one and a half yards span.</i>			
129	Brickwork in Chunam.....	2 9 0	330	
278	Sqr. yds. plastering in Chunam.....	0 2 6	43	
265	Earthwork.....	0 1 6	25	
	Centrings.....	0 0 0	68	
	Sundries at 5 per cent.....	0 0 0	20	
				486
	<i>Bridge of 3 arches of four yards span.</i>			
223	Brickwork in Chunam.....	2 10 0	585	
333	Sqr. yds. Plastering.....	0 2 6	52	
456	Earthwork.....	0 1 6	43	
	Centrings.....	0 0 0	180	
	Baling and temporary dams.....	0 0 0	90	
	Sundries at 5 per cent.....	0 0 0	34	
				984
	<i>Bridge of 3 arches of six yards span.</i>			
424	Brickwork in Chunam.....	2 10 0	1113	
570	Sqr. yds. Plastering.....	0 2 6	89	
675	Earthwork.....	0 1 6	63	
	Centrings.....	0 0 0	270	
	Baling and temporary dams.....	0 0 0	60	
	Sundries at 5 per cent.....	0 0 0	63	
				1658
	<i>Bridge of 2 arches of five yards span.</i>			
244	Brickwork in Chunam.....	2 10 0	640	
337	Sqr. yds. Plastering in Chunam.....	0 2 6	53	
472	Earthwork.....	0 1 6	44	
	Centrings.....	0 0 0	150	
	Baling and temporary dams.....	0 0 0	60	
	Sundries at 5 per cent.....	0 0 0	36	
				983
	<i>Bridge of 3 Arches of twelve yards span.</i>			
1114	Brickwork in Chunam.....	2 10 0	2924	
1215	Sqr. yds. Plastering in Chunam.....	0 2 6	190	
1290	Earthwork.....	0 1 6	121	
	Centrings.....	0 0 0	540	
	Baling and temporary dams.....	0 0 0	60	
	Sundries at 5 per Cent.....	0 0 0	162	
				3,997
	Total Estimate.....			19,740

COIMBATORE,

2d May 1853.

(Signed) A. B.

District Engineer.

APPENDIX E 2.

Specimen Detailed Working Estimate for the same work as the foregoing; such as it is proposed shall be not sent up, but retained by the District Engineer for the guidance of the Officer executing the work.

(GENERAL DEPARTMENT)

(NEW WORK)

PUBLIC ROADS.

DETAILED WORKING ESTIMATE NO. 1 OF 1933-34.

ROAD.—No. 5, TRUNK ROAD.

DISTRICT. COIMBATORE.

WORK. CONSTRUCTING ROAD FROM COIMBATORE TO WALLIAUR, 15 MILES, 4 FURLONGS, 146 YARDS.

DESCRIPTION OF SURFACE.	Nature of Soil.	Distance.		Measurement.			Cubic Yards.					No.	NATURE OF WORK.	
		Miles.	Yards.	Yards.			Metalling.	Turfing.	Clearing Jungle.	Removing Rock.	Rough Stone.			
				Length.	Breadth.	Height or Depth.								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
From Noel bridge.	Loam.	309	124	124	10-12	0-4	3321	248						Raising and Metalling.
Vellatoor Channel.	Gravel.	309	130	6										1 Bridge of 1 Arch of 5 yds. span.
To Tank bank.	Black.	309	400	270	13-0	1-0	3510	540						Raising Dry fields.
To West end of ditto.	False.	309	710	310	12-4	0-12	2848	620						Do.
Ditto.	Clay.	309	780	70	14-8	1-8	1523	140						Do.
Coorechy tank supply channel.		309	786	6										2 Bridge of 1 Arch of 4 yds. span.
Ditto.	Ditto.	309	1220	424	14-8	1-8	9222	848						Raising in the Tank bed.
Paddy fields.	Red.	309	1420	210	12-0	1-0	2730							Do.
Irrigation Channel.		309	1421	1										3 Small bridge of 1 Vent of 1 yd. span.
Sugar cane fields.	Ditto.	309	1670	249	12-10	0-14	2751							Raising.

Irrigation Channel.	Red.	309	1674	4										4 Small bridge of 1 vent of 1 yd span.
Wet land.		310		86	12-4	0-12	790							Raising.
							23707	2396						
Ditto.	Ditto.	310	140	140	12-4	0-12	1286							do.
Irrigation Channel.		310	141	1										6 Small bridge of 1 vent of 1 yd span.
Wet land.	Ditto.	310	510	369	12-4	0-12	3390							Raising.
Two Irrigation channels.		310	512	2										7 Small bridge of 1 vent of 1 yd span.
Garden land.	Ditto.	310	700	188	1-8	0-8	141							Side channels and levelling.
To Soondkarpettooor hedge.														do.
Road.	Ditto.	310	1460	760	1-8	0-8	570							Channel on one side and do.
Do.		311		300	1-0	0-8	150							
							5537							
To top of Mound.	Gravel.	311	440	440	1-0	0-8	220							do.
Do.	Ditto.	311	470	30	11-0	1-0	330							Lowering top of mound.
Dry fields.	Hard.	311	1710	1240	2-8	0-8	1550							Side channels and levelling.
	Rocky.	312		50	10-0	0-12		375						
							2100	375						
Mudruntum pass through hills.	Rocky.	312	50	50	10-0	0-2								10 Removing rock forming a re-
				50	0-12	1-5				62-8		49-311		vetment, and filling with
				50	10-0	0-12								gravel &c.
				50	10-0	0-2								12 do.
				50	0-12	1-5				62-8				13 do.
Dry fields.	Red.	312	570	520	2-8	0-8	650							Side channels.
Muddookuray Jungle Stream.	Hard.	312	600	30	0-12	3-0						45-0		14 Road dams.
	Hard.	312	1260	650	10-0	0-4	1625							Levelling.
Rock.	Rocky.	312	1330	70	10-0	0-4	175							15 Removing rock and levelling.
Dry fields.	Red.	312	1670	350	10-0	0-4	875							Levelling.
Jungle Stream.	Do.	312	1672	4	0-12	2-0								6-0 16 Road dam.
		313		88	10-0	0-4	230							Levelling.
							3545	375						

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
To Kureombapollum road.....	Gravel. Red.	313 959	959	10-0	0-4	2398								Leveling. Leveling.
Jungle Stream.....		313 1239	270	10-0	0-6	1013						18-12 19	Road Dam.	
Jungle Stream.....	Hd. Gravel.	313 1245	10	0-12	2-8									Leveling.
Jungle Stream.....		313 1420	185	10-0	0-4	463								19 Small bridge of 3 Vents of 1 1/2 yard. span.
To Muddabokuray Iyengar Pa- gada.....	Do.	313 1425	5											Side Channels and levelling (new line ends.)
Dry fields.....	Hd. Red.	313 1739	314	2-8	0-8	393								do.....do.....do.....
		314	21	2-8	0-8	20								do.....do.....do.....
						1293								do.....do.....do.....
Dry fields.....	Do.	314 1029	1029	2-8	0-8	1286								do.....do.....do.....
Jungle Stream.....		314 1032	8	0-12	2-8							16-0 21	Road Dam.	
		315	726	2-8	0-8	310								Side Channels and levelling.
						2196								do.....do.....do.....
Shoonguttoor Jungle Stream.....		315 142	142	2-8	0-8	173								do.....do.....do.....
		315 146	16	0-12	2-8							16-12 23	Road Dam.	
Jungle Stream.....	Hd. Gravel.	315 1123	907	2-8	0-8	1209								Side Channels and levelling.
Dry fields.....	Do.	315 1126	7	0-12	2-8							10-8 24	Road Dam.	
		315 1223	312	2-8	0-8	399								Side Channels and levelling a Road to go North of present track.
Umanapallum Jungle Stream.....		315 1446	15											Bridge of 3 Arches of 4 yd. span.
		316	314	2-8	0-8	393								Side Channels and levelling.
						2170								do.....do.....do.....
Dry fields.....	Hd. Red.	316 274	274	2-8	0-8	343								do.....do.....do.....
Jungle Stream.....		316 276	10	0-12	2-8							9-0 27	Road Dam.	
	Red.	316 684	388	2-8	0-8	483								Side Channels and levelling.
Jungle Stream.....		316 686	6	0-12	2-8							9-0 28	Road Dam.	
	Do.	316 874	298	10-8	0-8	1049								Side Channels and levelling a Road to go further South.
Jungle Stream.....		316 876	4	0-12	2-8							6-0 29	Road Dam.	

Limits of Yettundy.....	Hd. red.	316 1036	160	2-8	0-8	200								Side channels and levelling.
		317.....	724	2-8	0-8	905								do.....do.....do.....
													30	
						2973								
		317 1346	1366	2-8	0-8	1708								do.....do.....do.....
		318.....	394	2-8	0-8	690								do.....do.....do.....
													31	
						2398								
Opposite to Menachepooram.....		318 726	726	3-8	0-8	1271								do.....do.....do.....
To Poendoorkunda Govenden														
Choultry.....		318 1716	990	2-8	0-8	1238								do.....do.....do.....
		319.....	44	2-8	0-8	55								do.....do.....do.....
						2564							32	
Dry fields.....		319 746	746	2-8	0-8	933								do.....do.....do.....
To tappal Choultry.....	Rocky.	319 896	150	10-0	0-4	375				375				Removing rock and levelling.
	Hd. red.	319 1456	560	10-0	0-4	1400								Leveling.
Dry fields North.....	Do.	319 1546	90	10-0	0-4	225								Leveling. Jungle begins.
		320.....	214	10-0	0-4	535								Leveling thick forest.
													34	
						3468								
								</						

135

[illegible]

ABSTRACT.

[illegible]

Detailed Measurements of Bridges and Tunnels.

PARTICULARS OF WORK.	MEASUREMENT, IN YARDS AND ANNAS.				
	Length.	Breadth.	Depth.	Number.	Total.
(1) <i>Bridge of one arch of 5 yards span.</i>					
Foundation to abutments.....	8-11	1- 8	1- 8	2	39- 1
Do. to wingwalls.....	4-14	1- 4	1- 8	4	36- 9
Abutments.....	8- 7	1- 4	1-10	2	34- 4
Wings (3-4 high).....	4-14	2- 0½	0- 0	4	39-10
Spandrills next abutments (0-12 high).....	2- 4	0- 6	0- 0	4	3- 6
Parapets to wings including cornices.....	8-10	0- 8	1- 0	4	17- 4
Arch.....	6- 2	8- 1	0- 6	1	18- 8
Brick work in chunam.....	.....	.....	.....	.....	188-10
Abutments.....	11-12	0- 0	1-10	2	38- 3
Wingwalls and their parapets.....	4-14	0- 0	4- 6	2	55- 5
Faces of arches and spandrills including parapets and cornices.....	5- 0	0- 0	2- 8	2	35- 0
Soffit of arches.....	6- 2	8- 1	0- 0	1	49- 6
Plastering S. yds.....	.....	.....	.....	.....	207-14
Excavation of foundation of wings and abutments.....	7-14	11- 8	1- 8	2	271-11
Fillings in approaches.....	8-14	7- 0	1- 0	2	124- 4
Earthwork C. yds.....	.....	.....	.....	.....	306-15

PARTICULARS OF WORK.	MEASUREMENT, IN YARDS AND ANNAS				
	Length.	Breadth.	Depth.	Number.	Total.
(2) Bridge of one arch of 4 yards span.					
Foundation to abutments.....	8-10	1-4	2-8	2	53-14½
Foundation to wingwalls.....	4-8	1-4	2-8	2	58-4
Abutments.....	8-6	1-0	1-13	2	30-6
Wings (3-0 high).....	4-8	1-12½	0-0	4	31-13
Spandrills next abutments (0-7 high).....	1-9	0-3½	0-0	4	1-6
Parapets to wings, including cornices.....	7-8	0-8	0-0	4	15-0
Arch.....	5-0	8-1	0-6	1	15-2
Brickwork in chunam.....					203-13½
Abutments.....	11-0	0-0	1-13	2	39-14
Wing walls and their parapets.....	4-8	0-0	3-4	4	58-8
Faces of arch and spandrills including parapets and cornices.....	4-0	0-0	2-5½	2	18-12
Soffit of arch.....	5-0	8-1	0-0	1	40-5
Plastering S. yds.....					157-7
Excavation of foundation of wings and abutments.....	8-14	12-8	2-8	2	515-10
Filling in approaches.....	7-12	7-0	0-0	2	108-8
Earthwork C. yds.....					624-2½
(3, 4, 6 and 7) Four Tunnels each of one vent of one yard span.					
Floor.....	10-0	2-4	0-8	1	11-4
Do.....	2-0	2-12	0-8	2	5-8
Sidewalls.....	10-0	0-8	1-8	2	15-0
Wings.....	2-4	0-8	1-10	4	7-5
Parapets.....	2-0	0-8	0-10	2	1-4
Retaining walls.....	3-4	0-8	0-8	2	1-10
Covering.....	10-0	1-4	0-6	1	4-11
Brick work in chunam.....					46-10
Floor.....	10-0	1-0	0-0	1	10-0
Wings.....	2-0	1-8	0-0	2	6-0
Sidewalls.....	2-12	0-0	2-2	4	23-6
Parapets.....	10-0	0-0	1-6	2	27-8
Soffit.....	2-0	0-0	1-9	2	6-4
Plastering in Chunam S. yds.....					83-12
Excavating foundation below floor.....	10-0	3-12	1-8	1	56-4
Do. Do. between and below wings.....	3-4	4-4	1-8	2	41-7
Sand below floor.....	14-0	3-0	0-8	1	21-0
Earthwork C. yds.....					118-11
(19) Tunnel of 3 Vents of one and a half yards span.					
Floor.....	10-0	6-12	0-8	1	33-12
Piers.....	2-8	7-6	0-8	2	18-7
Sidewalls.....	9-12	0-8	1-15	2	18-14
Wings.....	10-0	0-8	1-15	2	19-6
Parapets.....	2-12	0-8	2-2	4	11-11
Do.....	4-8	0-8	0-10	2	2-13

PARTICULARS OF WORK.	MEASUREMENT, IN YARDS AND ANNAS.				
	Length.	Breadth.	Depth.	Number.	Total.
Retaining walls.....	8-0	0-8	0-8	2	4-0
Coverings.....	10-0	1-12	0-6	3	19-11
Brick work in Chunam.....					128-10
Floor.....	10-0	1-8	0-0	3	45-0
Wings.....	2-8	4-2	0-0	2	20-10
Piers.....	3-4	0-0	2-10	4	34-2
Sidewalls.....	21-12	0-0	1-13	2	78-14
Parapets.....	10-10	0-0	1-13	2	36-4
Soffits.....	4-8	0-0	4-9	2	14-1
Plastering in Chunam S. yds.....	10-0	1-10	0-0	3	48-12
Excavating foundations below floor.....	10-0	8-4	1-8	1	123-12
Do. Do. between and below wings.....	3-12	8-14	1-8	2	99-14
Sand below floor.....	15-0	5-8	0-8	1	41-4
Earthwork C. yds.....					264-14
(25) Bridge of three arches of 4 yards span.					
Foundation to abutments.....	8-10	1-4	1-8	4	32-5½
Do. to wingwalls.....	0-0	0-0	0-0	4	30-15
Do. to piers.....	0-0	0-0	0-0	2	25-14
Abutments.....	8-6	1-0	1-9	2	26-3
Wings (2-12 high).....	4-2	1-9	0-0	4	25-12½
Piers.....	8-6	0-12	1-9	2	19-10
Spandrills next abutments (0-7 high).....	1-9	0-3½	0-0	4	1-6
Do. to middle arches (0-7 high).....	4-12	0-3½	0-0	4	4-2½
Parapets to wings including cornices.....	7-2	8-8	0-8	4	7-2
Do. to arches and piers.....	0-0	0-0	0-0	4	4-12
Arches.....	5-0	0-1	0-6	3	45-5½
Brick work in chunam.....					223-8
Abutments.....	11-0	0-0	1-9	2	34-6
Piers.....	19-0	0-0	1-9	2	59-6
Wing walls and their parapets.....	4-2	0-0	3-2	4	51-9
Faces of arches and spandrills, including parapets and cornices.....	4-12	0-0	2-5½	3	66-13
Soffits of arches.....	5-0	8-1	0-0	3	120-15
Plastering S. yds.....					333-1
Excavation of foundation of wings and abutments.....	6-14	1-8	1-8	2	237-8
Do. of piers.....	11-8	2-8	1-8	2	86-4
Filling in approaches.....	7-6	7-0	1-0	2	103-4
Do. Roadway over bridge.....	4-12	7-0	0-7	2	29-1½
Earthwork C. yds.....					455-12½
(35) Bridge of three arches of 6 yards span.					
Foundation to abutments.....	8-12	1-12	1-8	2	45-15
Do. to wingwalls.....	6-0	1-8	1-8	4	64-0
Do. to piers.....	8-12	1-4	1-8	2	32-13
Abutments.....	8-8	1-8	1-12	2	44-10

PARTICULARS OF WORK.	MEASUREMENT IN YARDS, AND ANNAS.				
	Length.	Breadth.	Depth.	Number.	Total.
Wings (4-6 high).....	6-0	2-14	0-0	4	69-6
Piers.....	8-8	1-0	1-12	2	29-12
Spandrills next abutments (1-2 high).....	3-0	0-9	0-0	4	6-12
Do. to middle arches (1-2 high).....	7-0	0-9	0-0	4	15-12
Parapets to wings including cornices.....	10-8	0-8	1-0	4	21-0
Do. to arches and piers.....	7-0	0-8	1-0	4	14-0
Arches.....	7-7	8-1	0-8	3	89-15
Brick work in chunam.....					423-15
Abutments.....	12-8	0-0	1-12	2	43-12
Piers.....	20-8	0-0	1-12	2	71-12
Wing walls and their parapets.....	6-0	0-0	4-12	4	114-0
Faces of arches and spandrills including parapets and cornices.....	7-0	0-0	3-12	6	160-2
Soffits of arches.....	7-7	8-1	0-0	3	179-14
Plastering S. yds.....					569-8
Excavation of foundation of wings and abutments.....	9-4	11-8	1-8	2	319-2
Do. to piers.....	11-8	2-12	1-8	2	94-14
Filling in approaches.....	10-12	7-0	1-0	2	159-8
Do. roadway over bridge.....	7-0	7-0	1-2	2	110-4
Earthwork C. yds.....					674-12
(38) Bridge of 2 arches of five yards span.					
Foundation to abutments.....	8-11	1-8	1-8	2	39-11
Do. to wingwalls.....	4-14	1-4	1-8	4	36-9
Do. to pier.....	8-11	1-2	1-8	1	14-19
Abutments.....	8-7	1-4	1-10	2	34-4
Wings (3-4 high).....	4-14	2-0	0-0	4	39-10
Pier.....	8-7	0-14	4-10	1	12-0
Spandrills next abutments (0-12 high).....	2-4	0-6	0-0	4	8-6
Spandrills to middle arches (0-12 high).....	5-14	0-6	0-0	2	4-6
Parapets to wings including cornices.....	8-10	0-8	1-0	4	17-4
Do. to arches and piers.....	6-14	0-1	1-0	2	5-14
Arches.....	6-3	8-1	0-6	2	37-0
Brick work in chunam.....					244-1
Abutments.....	11-12	0-0	1-10	2	33-3
Pier.....	19-12	9-0	1-10	1	32-1
Wing walls and their parapets.....	4-14	0-0	4-6	4	85-5
Faces of arches and spandrills including parapets and cornices.....	5-14	0-0	3-8	4	82-4
Soffits of arches.....	6-2	8-1	0-0	2	98-12
Plastering S. yds.....					336-9
Excavation of foundation of wings and abutments.....	7-14	11-9	1-8	2	271-11
Do. to pier.....	11-8	2-10	1-8	1	45-4
Filling in approaches.....	8-14	7-0	1-0	2	124-4
Do. roadway over bridge.....	5-14	7-9	11-12	1	29-12
Earthwork C. yds.....					472-1

PARTICULARS OF WORK.	MEASUREMENT IN YARDS, AND ANNAS.				
	Length.	Breadth.	Depth.	Number.	Total.
(44) Bridge of 3 arches of twelve yards span.					
Foundation to abutments.....	9-2	2-10	1-8	2	71-14
Do. to wingwalls.....	9-12	2-4	1-8	4	131-10
Do. to piers.....	9-2	2-0	1-8	2	54-12
Abutments.....	8-14	2-6	2-10	2	110-10
Wings (6-8 high).....	9-12	7-1	0-0	4	277-4
Piers.....	8-14	1-12	2-10	2	81-9
Spandrills next abutments (2-4 high).....	5-6	1-2	0-0	4	25-3
Do. to middle arches (2-4 high).....	13-12	1-2	0-0	4	64-7
Parapets to wings including cornices.....	18-2	0-8	1-4	4	45-5
Do. to arches and piers.....	13-12	0-8	1-4	4	34-6
Arches.....	14-6	8-1	0-10	3	217-5
Brickwork in chunam.....					1114-5
Abutments.....	15-2	0-0	2-10	2	79-6
Piers.....	23-2	0-0	2-10	2	121-6
Wingwalls and their parapets.....	9-12	0-0	6-8	4	253-8
Faces of arches and spandrills including parapets and cornices.....	13-12	0-0	5-0	6	412-8
Soffits of arches.....	14-6	8-1	0-0	3	347-11
Plastering S. yds.....					1214-8
Excavation of foundation of wings and abutments.....	13-14	11-8	1-8	2	478-11
Do. to piers.....	11-8	3-8	1-8	2	129-12
Filling in approaches.....	18-6	7-0	0-0	2	257-4
Do. roadway over bridge.....	13-12	7-0	2-0	2	433-2
Earthwork C. yds.....					1289-13

ABSTRACT OF THE WHOLE.

Quantities.	DESCRIPTION OF WORK.	Rate.	Amount.	Amount of each part.
C. yds.		Rs. A. P.	Rupees.	Rupees.
74930	Earthwork at.....	0 1 0		4,683
	Metalling.			
7646	At.....	0 4 6	2,150	
1699	At.....	0 7 0	743	
				2,893
913	Removing rock.....	0 4 0		228
	Rough Stone Work.			
162	12 Road dams.....	1 8 0	273	
223	3 Revetments.....	1 8 0	334	
				607
	Clearing Forest 2 Miles, 3 Furlongs long by 80 yards wide, 52 Cawnies.....	20 0 0		1,040
	14 Miles Stones.....	3 8 0		49
	Carried forward.....			9,500

Quantities.	DESCRIPTION OF WORK.	Rates.			Amount.	Amount of each part.
C. yds.		Rs.	A.	P.	Rupees.	Rupees.
	Brought forward..					9,500
	<i>Bridge of 1 arch of five yards span.</i>					
189	Brickwork in Chunam.....	2	10	0	496	
208	Sqr. yds. plastering in Chunam.....	0	2	6	33	
396	Earthwork.....	0	1	6	37	
	Centrings.....	0	0	0	100	
	Baling and temporary dams.....	0	0	0	30	
	Sundries at 5 per cent.....	0	0	0	29	
						725
	<i>Bridge of 1 arch of four yards span.</i>					
204	Brickwork in Chunam.....	2	10	0	535	
157	Sqr. yds. plastering in Chunam.....	0	2	6	25	
624	Earthwork.....	0	1	6	59	
	Centrings.....	0	0	0	60	
	Baling and temporary dams.....	0	0	0	30	
	Sundries at 5 per cent.....	0	0	0	30	
						739
	<i>Four Tunnels each of 1 vent of one yard</i>					
47	Brickwork in Chunam.....	2	9	0	120	
84	Sqr. yds. plastering in Chunam.....	0	2	6	13	
119	Earthwork.....	0	1	6	11	
	Centrings.....	0	0	0	15	
	Sundries at 5 per cent.....	0	0	0	8	
	For one Tunnel.....				167	
	For four Tunnels.....					668
	<i>One Tunnel of 3 vents of one and a half yards span.</i>					
129	Brickwork in Chunam.....	2	9	0	330	
278	Sqr. yds. plastering in Chunam.....	0	2	6	43	
265	Earthwork.....	0	1	6	25	
	Centrings.....	0	0	0	68	
	Sundries at 5 per cent.....	0	0	0	20	
						486
	<i>Bridge of 3 arches of four yards span.</i>					
223	Brickwork in Chunam.....	2	10	0	535	
333	Sqr. yds. plastering.....	0	2	6	52	
456	Earthwork.....	0	1	6	43	
	Centrings.....	0	0	0	150	
	Baling and temporary dams.....	0	0	0	90	
	Sundries at 5 per cent.....	0	0	0	34	
						984
	<i>Bridge of 3 arches of six yards span.</i>					
424	Brickwork in Chunam.....	2	10	0	1113	
570	Sqr. yds. plastering.....	0	2	6	89	
675	Earthwork.....	0	1	6	63	
	Carried forward.....				1,265	13,102

Quantities.	DESCRIPTION OF WORK.	Rate.			Amount.	Amount of each part.
C. yds.		Rs.	A.	P.	Rupees.	Rupees.
	Brought forward..				1265	13,102
	Centrings.....	0	0	0	270	
	Baling and temporary dams.....	0	0	0	60	
	Sundries at 5 per cent.....	0	0	0	63	
						1,658
	<i>Bridge of 2 arches of five yards span.</i>					
244	Brickwork in Chunam.....	2	10	0	640	
337	Sqr. yds. plastering in Chunam.....	0	2	6	53	
472	Earthwork.....	0	1	6	44	
	Centrings.....	0	0	0	150	
	Baling and temporary dams.....	0	0	0	60	
	Sundries at 5 per cent.....	0	0	0	36	
						983
	<i>Bridge of 3 arches of twelve yards span.</i>					
1114	Brickwork in Chunam.....	2	10	0	2,924	
1215	Sqr. yds. plastering in Chunam.....	0	2	6	193	
1290	Earthwork.....	0	1	6	121	
	Centrings.....	0	0	0	540	
	Baling and temporary dams.....	0	0	0	60	
	Sundries at 5 per cent.....	0	0	0	162	
						3,997
	Total Estimate.....					19,740

COIMBATORE,

2d May 1853.

(Signed) A. B.

District Engineer.

APPENDIX F 1.

Specimen Estimate for a new Work of Building such as is proposed shall be sent up to the Controlling Authorities.

(GENERAL DEPARTMENT.)

(NEW WORK.)

BUILDINGS.

ESTIMATE NO. 1. OF 1853-54.

DISTRICT-CHINGLEPUT.

WORK. CONSTRUCTING A CIVIL DISPENSARY AT CHINGLEPUT.

Quantities.	DESCRIPTION OF WORK.	Rate.	Amount.	Amount of each part.
C. yds.		Rs. A. P. Rupees	Rupees.	
	<i>Dispensary.</i>			
353	New rough stone in chunam.....	1 4 0	441	
512	Brick in chunam.....	2 4 0	1153	
20982	Square feet, plastering with 2 coats of chunam.....	1 8 0	315	
4389	Do. flooring with brick in jelly in chunam.....	2 4 0	99	
4402	Do. roofing with Palmira rafters, teak wood reepers, nails, flat and pan tiles and chunam borders &c.....	16 0 0	704	
2696	Do. roofing with teak wood rafters, reepers, nails, 3 coarse flat tiles and plastering 3 coats of chunam.....	17 7 7	471	
390	Do. honey comb work.....	2 8 0	10	
27	Columns complete.....	3 8 0	94	
7	Venetian doors.....	22 0 0	154	
20	Venetian windows.....	14 0 0	280	
6	Doors.....	14 0 0	84	
4	Windows.....	6 8 0	26	
430	Running feet of cornice work.....	0 3 0	80	
310	do. wall plates with teak wood rafters at 11 as, for 10 feet of length.....	0 0 0	21	
	Scaffolding and centring.....	0 0 0	40	
	Excavating foundation and filling the basement.....	0 0 0	40	
	Sundries at 5 per Cent.....	0 0 0	201	
				4,213
	<i>Cookroom and Privy.</i>			
14	New rough stone in chunam.....	1 4 0	19	
25	Brick in chunam.....	2 4 0	56	
1027	Square feet, plastering with 2 coats of chunam.....	1 8 0	15	
160	Do. flooring with brick in jelly in chunam and plastering over it.....	2 4 0	4	
318	Do. roofing with palmirah rafters, reepers, nails, pan tiles and chunam borders, &c.....	14 0 0	45	
64	Do. honey comb work.....	2 8 0	2	
	4 Verandah bressummers.....	1 0 0	4	
	Excavating foundation.....	0 0 0	7	
	Sundries at 5 per cent.....	0 0 0	7	
				159
	Another cookroom and privy of the same pattern as above.....			159
	<i>Compound Wall.</i>			
154	Rough stone in chunam.....	1 4 0	192	
503	Cubic feet, brick in chunam ..	0 1 4	42	
2574	Square feet, pointing with chunam.....	0 8 0	13	
7	Do. plastering with 2 coats of chunam, coping compound wall and pillars.....	1 8 0	10	
	1 Gate door including frame hinges &c.....	0 0 0	13	
	Excavating foundation.....	0 0 0	8	
	Sundries at 5 per cent.....	0 0 0	14	
				297
	Carried forward.....			4,828

APPENDIX F 1. (Continued.)

Quantities.	DESCRIPTION OF WORK.	Rate.	Amount.	Amount of each part.
C. yds.		Rs. A. P. Rupees	Rupees.	
	Brought forward.....			4828
	<i>Store room and Cook room.</i>			
14	Rough stone in chunam.....	1 4 0	19	
24	Brick in chunam.....	2 4 0	54	
942	Square feet plastering with chunam.....	1 8 0	14	
160	Square feet flooring with brick jelly in chunam.....	2 4 0	4	
50	Square feet honey comb work.....	2 8 0	1	
318	Do. Roofing with palmirah rafters, reepers, nails, pan tiles, chunam borders &c.....	14 0 0	44	
	1 Door including frames hinges &c.....	0 0 0	12	
	1 Window including do.....	0 0 0	7	
	2 Verandah Bressummers.....	1 0 0	2	
	Excavating foundation.....	0 0 0	7	
	Sundries.....	0 0 0	8	
				172
	<i>Dead house and Sweeper's room.</i>			
14	Rough stone in chunam.....	1 4 0	18	
24	Brick in chunam.....	2 4 0	54	
969	Square feet plastering with chunam.....	1 8 0	15	
160	Do. Flooring with brick jelly in chunam.....	2 4 0	4	
80	Do. Honey comb work.....	2 8 0	2	
318	Do. Roofing with palmirah rafters, reepers, nails, pan tiles and chunam borders &c.....	14 0 0	45	
	1 Door including frames hinges &c.....	0 0 0	12	
	2 Windows including do. do.....	7 0 0	14	
	Excavating foundation.....	0 0 0	7	
	2 Verandah Bressummers.....	0 0 0	2	
	Sundries at 5 per cent.....	0 0 0	8	
				181
	<i>Well.</i>			
37	Yards. Excavating.....	0 4 0	22	
86	Do. Brick in clay and brick in chunam.....	2 0 0	73	
	House for dresser.....			30
				95
	Total Company's Rupees.....			5,306

CHINGLEPUT,

2nd August, 1853.

(Signed) A. B.

District Engineer.

APPENDIX F 2.

Specimen Detailed Working Estimate for same work as the foregoing such as is proposed shall be not sent up but retained by the District Engineer for the guidance of the Officer executing the work.

(GENERAL DEPARTMENT.)

(NEW WORK.)

BUILDINGS.

ESTIMATE NO. 1. OF 1853-54.

DISTRICT—CHENGLEPUT.

WORK. CONSTRUCTING A CIVIL DISPENSARY AT CHENGLEPUT.

PARTICULARS OF WORK.	MEASUREMENT IN FEET AND INCHES.				
	Length.	Depth or height.	Breadth or thickness.	Superficial feet.	Cubic feet.
<i>Dispensary.</i>					
Foundation to principal walls.....	378-0	3-0	2-7 $\frac{1}{2}$	.....	2976-9
Do. to cross wall to bathing rooms.....	81-0	3-0	2-7 $\frac{1}{2}$	.....	637-10 $\frac{1}{2}$
Do. to 48 pillars.....	102-0	3-0	2-7 $\frac{1}{2}$	.....	803-3
Do. to retaining wall between pillars.....	280-0	3-0	2-7 $\frac{1}{2}$	.....	2205-0
Do. to side walls of steps.....	7-6	1-6	2-9	.....	30-11 $\frac{1}{2}$
Basement to principal walls.....	378-0	2-6	2-0	.....	1890-0
Do. to 12 verandahs cross walls.....	81-0	2-6	2-0	.....	405-0
Do. to 48 Pillars.....	102-0	2-6	2-3	.....	573-9
New rough stone in chunam Cubic feet.....					9522-6 $\frac{1}{2}$
Being equal to Cub. Yards.....					352-18 $\frac{1}{2}$
Principal walls above.....	310-0	14-4 $\frac{1}{2}$	1-6	.....	6684-4 $\frac{1}{2}$
Cross walls to principal walls.....	68-0	14-9	1-6	.....	1504-6
Cross walls to Insane ward.....	27-0	11-10 $\frac{1}{2}$	1-6	.....	480-11 $\frac{1}{2}$
48 pillars above.....	38-0	11-3	1-6	.....	641-3
Arch.....	102-0	11-3	1-6	.....	1721-3
Side walls of arch.....	320-0	0-9	1-6	.....	360-0
Gable to principal walls.....	280-0	1-6	1-6	.....	630-0
Retaining wall under the honey comb.....	63-0	2-10 $\frac{1}{2}$	1-6	.....	293-3
Coping round the 4 doorways.....	85-0	3-0	1-6	.....	382-6
Walls including parapet.....	76-0	1-0	1-6	.....	114-0
6 side walls of steps.....	382-0	2-9	1-6	.....	1575-9
Steps.....	7-6	2-6	2-0	.....	37-6
Pediment.....	32-0	1-9	2-0	.....	112-0
	23-6	1-9	3-0	.....	123-4 $\frac{1}{2}$
	27-6	3-0	1-6	.....	123-9
Cubic feet.....					14784-5 $\frac{1}{2}$
Deduct for doors and windows.....					951-6
Brick in chunam Cubic feet.....					13832-11 $\frac{1}{2}$
Being equal to C. yds.....					512 $\frac{1}{2}$
Principal walls.....	620-0	14-4 $\frac{1}{2}$	8912-6		
Cross do.....	136-0	14-9	2006-0		
Cross do. to verandah.....	54-0	11-10 $\frac{1}{2}$	641-3		
48 pillars.....	62-0	11-3	697-6		
	204-0	11-3	2295-0		

APPENDIX F. 2. (Continued.)

PARTICULARS OF WORK.	MEASUREMENT IN FEET AND INCHES.				
	Length.	Depth or height.	Breadth or thickness.	Superficial feet.	Cubic feet.
Side Walls of arch.....	560-0	.....	1-9	960-0	
Arch.....	320-0	.....	1-6	480-0	
Gables.....	136-0	.....	2-10 $\frac{1}{2}$	391-0	
Parapets.....	382-0	.....	5-6	2101-0	
Retaining wall under honey comb work.....	170-0	.....	4-6	765-0	
Coping around the doorways.....	152-0	.....	1-0	152-0	
Pediment.....	55-0	.....	3-0	165-0	
Basement.....	386-0	.....	2-6	965-0	
Side walls of steps.....	17-0	.....	7-0	119-0	
Steps.....	32-0	.....	4-3	136-0	
	23-6	.....	7-6	176-3	
Plastering with 2 coats of chunam S. feet.....				20,982-6	
	41-0	.....	17-0	697-0	
	20-0	.....	17-0	340-0	
Flooring with brick in jelly in chunam.....	24-0	.....	17-0	408-0	
	27-0	.....	17-0	459-0	
	326-9	.....	7-6	2450-7 $\frac{1}{2}$	
	25-0	.....	10-0	250-0	
S. feet.....				4604-7 $\frac{1}{2}$	
Deduct for pillars and cross walls.....				215-7 $\frac{1}{2}$	
S. feet.....				4389	
Roofing with palmirah rafters, teak wood reepers, } nails, flat and pan tiles and chunam borders &c. }	158-0	.....	20-0	3160-0	
	138-0	.....	9-0	1242-0	
S. feet.....				4402	
Roof with Teak wood rafters, reepers, nails 3 course } flat tiles and plastering 3 coats of chunam..... }	325-6	.....	7-6	2441-3	
	25-6	.....	10-0	255-0	
S. feet.....				2696-3	
<i>Cook Room and Privy.</i>					
Foundation to cookroom.....	73-0	1-0	2-6	.....	182-6
Basement.....	73-0	1-6	2-0	.....	219-0
New rough stone in chunam Cubic feet.....					401-6
Being equal to C. yds.....					14- $\frac{231}{27}$
Walls above.....	24-6	9-0	1-6	.....	330-9
Cross wall including gable.....	19-0	7-6	1-6	.....	213-9
	4-6	6-0	1-6	.....	40-6
Pillars above.....	1-8	8-0	1-3	.....	15-0
Retaining wall under the honey comb work.....	17-0	3-0	1-6	.....	76-6
Brick in chunam Cubic feet.....					676-6
Being equal to C. yds.....					25- $\frac{14}{27}$

PARTICULARS OF WORK.	MEASUREMENT IN FEET AND INCHES.				
	Length.	Depth or height.	Breadth or thickness.	Superficial feet.	Cubic feet.
Walls.....	44-6	.....	9-0	400-6	
Cross walls.....	33-0	.....	7-6	285-0	
Pillars above.....	24-0	.....	7-6	180-0	
Retaining wall.....	36-0	.....	4-6	162-0	
Plastering with 2 coats of chunam 8. feet.....				1027-6	
Flooring with brick in jelly in chunam and plastering over it.....	20-0	.....	8-0	160-0	
Roofing with palmirah rafters, reepers, nails, pantiles and chunam borders &c.....	24-6	.....	13-0	318-6	
Honey comb.....	18-6	.....	13-6	64-9	
Compound wall.					
Foundation to compound wall.....	429-0	2-0	2-6		214-50
Do. gate pillars.....	4-6	3-0	2-6		30-0
Compound walls.....	429-0	3-0	1-6		1930-6
Gate pillars above.....	4-6	5-0	2-0		40-0
Rough stone in chunam Cubic feet.....					4145-6
Being equal to Cubic yards.....					153- $\frac{14}{27}$
Coping for compound wall.....	429-0	0-9	1-6		482-7 $\frac{1}{2}$
Head for gate pillars.....	4-0	3-0	1-9		21-0
Brick in chunam Cubic feet.....					503-7 $\frac{1}{2}$
Store Room and Cook Room.					
Foundation to store room.....	73-0	1-0	2-6		182-6
Basement.....	73-0	1-6	2-0		219-0
Rough stone in chunam Cubic feet.....					401-6
Being equal to Cubic yards.....					14 $\frac{1}{2}$
Walls above.....	24-6	9-0	1-6		330-9
	16-0	7-6	1-6		180-0
	13-0	6-0	1-6		117-0
Pillars.....	3-0	6-0	1-0		18-0
	1-6	7-6	1-3		14- $\frac{3}{4}$
Retaining wall under the honey comb work.....	6-9	3-0	1-6		30-4 $\frac{1}{2}$
Cubic feet.....					690-2 $\frac{1}{2}$
Deduct for doors and windows.....					42-2 $\frac{1}{2}$
Brick in chunam Cubic feet.....					648-0
Being equal to Cubic Yards.....					24-0
Walls.....	44-6	.....	9-0	400-6	
	35-0	.....	7-6	262-6	
	23-0	.....	6-0	138-0	
	10-0	.....	6-0	60-0	
	5-6	.....	7-6	41-3	
	22-6	.....	3-0	67-6	
Plastering with chunam Square feet.....				969-9	
Flooring with brick jelly in chunam.....	20-0	.....	8-0	160-0	
Honey comb work.....	6-9	.....	7-6	50-7 $\frac{1}{2}$	
	5-0	.....	6-0	30-0	
Square feet.....				80-7 $\frac{1}{2}$	
Roofing with palmirah rafters reepers nails, pantiles and chunam borders, &c.....	24-6	.....	13-0	318-6	
Well.					
10 feet in Diameter and 30 feet deep 10-2 x 7854 x 30 = 2356 feet or 87 $\frac{1}{2}$ yards.....					
Brick in Clay and Brick in Chunam 33 x 30 = 990 feet or 36 $\frac{2}{3}$ yards.....					

PARTICULARS OF WORK.	MEASUREMENT IN FEET AND INCHES.				
	Length.	Depth or height.	Breadth or thickness.	Superficial feet.	Cubic feet.
Pillars.....	5-6	.....	7-6	41-3	
Retaining walls.....	13-6	.....	2-0	40-6	
Plastering with chunam Square feet.....				942-9	
Flooring with brick jelly in chunam.....	20-0	.....	8-0	160-0	
Honey Comb.....	6-9	.....	7-6	50-7 $\frac{1}{2}$	
Roofing with palmirah rafters, reepers, nails, pantiles, and chunam borders &c.....	24-6	.....	13-0	318-6	
Dead house and sweeper's room.					
Foundation to the dead house.....	73-0	1-0	2-6		182-6
Basement.....	73-0	1-6	2-0		219-0
Rough stone in chunam Cubic feet.....					401-6
Being equal to Cubic yards.....					14 $\frac{1}{2}$
Walls above.....	24-6	9-0	1-6		330-9
	16-0	7-6	1-6		180-0
	13-0	6-0	1-6		117-0
Pillars.....	3-0	6-0	1-0		18-0
	1-6	7-6	1-3		14- $\frac{3}{4}$
Retaining wall under the honey comb.....	11-3	3-0	1-6		50-7 $\frac{1}{2}$
Cubic feet.....					710-5 $\frac{1}{2}$
Deduct for doors and windows.....					62-3
Brick in chunam Cubic feet.....					648-2 $\frac{1}{2}$
Being equal to Cubic yards.....					24-0
Walls.....	44-6	.....	9-0	400-6	
	35-0	.....	7-6	262-6	
	23-0	.....	6-0	138-0	
Pillars.....	10-0	.....	6-0	60-0	
	5-6	.....	7-6	41-3	
Retaining wall.....	22-6	.....	3-0	67-6	
Plastering with chunam Square feet.....				969-9	
Flooring with brick jelly in chunam.....	20-0	.....	8-0	160-0	
Honey comb work.....	6-9	.....	7-6	50-7 $\frac{1}{2}$	
	5-0	.....	6-0	30-0	
Square feet.....				80-7 $\frac{1}{2}$	
Roofing with palmirah rafters reepers nails, pantiles and chunam borders, &c.....	24-6	.....	13-0	318-6	
Well.					
10 feet in Diameter and 30 feet deep 10-2 x 7854 x 30 = 2356 feet or 87 $\frac{1}{2}$ yards.....					
Brick in Clay and Brick in Chunam 33 x 30 = 990 feet or 36 $\frac{2}{3}$ yards.....					

ABSTRACT OF THE WHOLE.

Quantities.	DESCRIPTION OF WORK.	Rate.	Amount.	Amount of each part.
		Rs. A. P.	Rupees.	Rupees.
C. yds.	<i>Dispensary.</i>			
353	New rough stone in chunam.....	1 4 0	441	
512	Brick in chunam.....	2 4 0	1153	
20982	Square feet, plastering with 2 coats of chunam.....	1 8 0	315	
4389	Do. flooring with brick in jelly in chunam.....	2 4 0	99	
4402	Do. roofing with Palmira rafters, teak wood reepers, nails, flat and pan tiles and chunam borders &c.....	16 0 0	704	
2696	Do. roofing with teak wood rafters, reepers, nails, 3 coarse flat tiles and plastering 3 coats of chunam.....	17 7 7	471	
390	Do. honey comb work.....	2 8 0	10	
	27 Columns complete.....	3 8 0	94	
	7 Venetian doors.....	22 0 0	154	
	20 Venetian windows.....	14 0 0	280	
	6 Doors.....	14 0 0	84	
	4 Windows.....	6 8 0	26	
430	Running feet of cornice work.....	0 3 0	80	
310	do. wall plates with teak wood rafters at 11 As. for 10 feet of length.....	0 0 0	21	
	Scaffolding and centring.....	0 0 0	40	
	Excavating foundation and filling the basement.....	0 0 0	40	
	Sundries at 5 per cent.....	0 0 0	201	
	<i>Cookroom and Privy.</i>			4,213
15	New rough stone in chunam.....	1 4 0	19	
25	Brick in chunam.....	2 4 0	56	
1027	Square feet, plastering with 2 coats of chunam.....	1 8 0	15	
160	Do. flooring with brick in jelly in chunam and plastering over it.....	2 4 0	4	
318	Do. roofing with palmira rafters, reepers, nails, pantiles and chunam borders, &c.....	14 0 0	45	
64	Do. honey comb work.....	2 8 0	2	
	4 Verandah bressummers.....	1 0 0	4	
	Excavating foundation.....	0 0 0	7	
	Sundries at 5 per cent.....	0 0 0	7	
	Another cook room and privy of the same pattern as above.....			159
	<i>Compound Wall.</i>			159
154	Rough stone in chunam.....	1 4 0	192	
503	Cubic feet, brick in chunam.....	0 11 4	42	
2574	Square feet, pointing with chunam.....	0 8 0	13	
7	Do. plastering with 2 coats of chunam, coping compound wall and pillars.....	1 8 0	10	
	1 Gate door including frame hinges &c.....	0 0 0	18	
	Excavating foundation.....	0 0 0	8	
	Sundries at 5 per cent.....	0 0 0	14	
	<i>Store room and Cook room</i>			297
15	Rough stone in Chunam.....	1 4 0	19	
24	Brick in chunam.....	2 4 0	54	
942	Square feet, plastering with chunam.....	1 8 0	14	
160	Square feet, flooring with brick jelly in chunam.....	2 4 0	4	
	Carried forward.....		91	4,828

143

Quantities.	DESCRIPTION OF WORK.	Rate.	Amount.	Amount of each part.
		Rs. A. P.	Rupees.	Rupees.
C. yds.	Brought forward.....		91	4,828
50	Square feet, honey comb work.....	2 8 0	1	
318	Do. roofing with palmira rafters, reepers, nails, pan tiles, chunam borders &c.....	14 0 0	44	
	1 Door including frames hinges &c.....	0 0 0	12	
	1 Window including do.....	0 0 0	7	
	2 Verandah Bressummers.....	1 0 0	2	
	Excavating foundation.....	0 0 0	7	
	Sundries.....	0 0 0	8	
	<i>Dead house and Sweeper's room.</i>			172
14	Rough stone in chunam.....	1 4 0	18	
24	Brick in chunam.....	2 4 0	54	
969	Square feet plastering with chunam.....	1 8 0	15	
160	Do. Flooring with brick jelly in chunam.....	2 4 0	4	
80	Do. Honey comb work.....	2 8 0	2	
318	Do. Roofing with palmira rafters, reepers, nails, pan tiles and chunam borders &c.....	14 0 0	45	
	1 Door including frames hinges &c.....	0 0 0	12	
	2 Windows including do. do.....	7 0 0	14	
	Excavating foundation.....	0 0 0	7	
	2 Verandah Bressummers.....	0 0 0	2	
	Sundries at 5 per cent.....	0 0 0	8	
	<i>Well.</i>			181
87	Yards. Excavating.....	0 4 6	22	
36	Do. Brick in clay and brick in chunam.....	2 0 0	73	
	House for dresser.....			95
				30
	Total Company's Rupees.....			5,306

CHENGLEPUT,

2nd August, 1853.

(Signed) A. B.

District Engineer.

APPENDIX G 1.

Estimate made by Mr. BRUCE, Chief Engineer of the Madras Railway for the Earth work, masonry, ballasting, fencing, &c. of one Section of 12½ Miles.

MADRAS RAILWAY.

ESTIMATE OF SECTION NO. 1. OF DISTRICT NO. 1.

BRIDGES AND BRICKWORK.

	Quantity. C. yds.	Rate.	Rupees.	A. P.	Rupees.	A. P.
3. 9 feet arches as per Plan No. 7 in a 9 feet Embankment. At 1 m. 30 chs. 8—72 and 11—26. In one Bridge.						
Excavation.....	60	0 2 0	7	8 0		
Brickwork.....	145	3 14 0	561	14 0		
			569	6 0		
Total in 3 Bridges.....					1,708	2 0
1. 9 feet arch, in a 7 feet Embankment. At 1 mile 70 chs.						
Excavation.....	60	0 2 0	7	8 0		
Brickwork.....	126	3 14 0	488	4 0		
					495	12 0
4 Double 6 feet arches in a 7 feet Embankment as per Plan No. 6. At 3 m. 32 chs.—4 m. 57 chs.—7 m. 59 chs.— 10 m. 34 chs.						
Excavation.....	177	0 2 0	22	2 0		
Brickwork.....	166	3 14 0	643	4 0		
			665	6 0		
Total cost of the four Bridges.....					2,661	8 0
2 Double 6 feet arches in a 9 feet Embankment as per Plan No. 6. At 10 m. 16 chs. and 10 m. 77 chs.						
Excavation.....	177	0 2 0	22	2 0		
Brickwork.....	189	3 14 0	732	6 0		
			754	8 0		
Total cost of the two Arches.....					1,509	0 0
3 Single 6 feet arches in a 9 feet Embankment as per Plan No. 5. At 1 m. 36 chs.—1 m. 64 chs.—8 m. 79 chs. In one Arch.						
Excavation.....	50	0 2 0	6	4 0		
Brickwork.....	133	3 14 0	515	6 0		
			521	10 0		
Total in 3 Arches.....					1,564	14 0
1 Single 6 feet arch in a 7 feet Embankment as per Plan No. 5. At 4 m. 62 chs.						
Excavation.....	50	0 2 0	6	4 0		
Brickwork.....	115	3 14 0	445	10 0		
					451	14 0
Carried forward Co.'s Rups.....					8,391	2 0

APPENDIX G 1. (Continued.)

	Quantity. C. yds.	Rate.	Rupees.	A. P.	Rupees.	A. P.
Brought forward.....					8,391	2 0
Bridge over Cochrane's Canal.						
Excavation.....	475	0 3 0	89	1 0		
Broken bricks.....	435	0 10 0	271	14 0		
Wells in foundations lineal feet.....	1,220	1 8 0	1,830	0 0		
Brickwork.....	1438	3 14 0	5,572	4 0		
Contingencies.....			236	13 0		
					8,000	0 0
Also 500 cubic yards of brick work where it may be required at per cubic yard.....	500	3 14 0	1,937	8 0		
					1,937	8 0
Three feet Barrel Culverts. 637 Lineal yards of single Culvert.						
Excavation.....	940	0 2 0	117	8 0		
Brickwork.....	1,210	3 14 0	4,688	12 0		
					4,806	4 0
Being Rs 7 As. 8 Pice 7 per lineal yard inclusive of ends.						
18 Inches Culverts.						
608 Lineal yards.						
Excavation.....	315	0 2 0	39	6 0		
Brickwork.....	546	3 14 0	2,115	12 0		
					2,155	2 0
Being 3 Rs. 8 As. 8 Pice per lineal yard inclusive of ends.						
Metalling of Roads.						
Miles chains Cubic yds						
Road at..... 0.40	125					
0.65	30					
0.72	30					
1.14	85					
1.31	85					
1.72	110					
2.12	20					
2.27	20					
2.55	20					
3.23	300					
3.76	20					
4.16	85					
5.38	33					
5.72	30					
7.27	100					
9.25	20					
10.6	20					
11.40	20					
12.10	20					
Where required	1000	2178	0 12 0	1629	12 0	1,629 12 0
50 Gates.....		5 0 0	250	0 0	250	0 0
Earthwork in Road Approaches.						
M. Chs. Cub. Yds.						
Road at..... 1.14.....	1,082					
1.31.....	2,108					
1.72.....	2,108					
2.12.....	50					
Carried forward.....					27,169	12 0

	Quantity. C. yds.	Rate.	Rupees.	A. P.	Rupees.	A. P.
Brought forward.....					27,169	12 0
M. Chs. Cub. Yds.						
2-27.....240						
2-55.....50						
3-23.....2,037						
3-76.....50						
4-16.....100						
5-88.....173						
5-72.....50						
7-27.....500						
9-25.....50						
10-6.....50						
11-40.....50						
12-10.....50						
	8,748	0 1 6	820	2 0	820	2 0
Earthwork in Cuttings and Embankments.						
1st Mile.....15,826.34						
2nd.....52,754.80						
3rd.....10,267.40						
4th.....16,590.20						
5th.....18,091.00						
6th.....18,916.40						
7th.....14,734.66						
8th.....26,230.80						
9th.....31,109.20						
10th.....55,378.60						
11th.....37,079.00						
12th.....32,465.60						
12 to 12-40 chains.....5,954.28						
	345,393.28					
		0 0 11	10,788	13 3	10,788	13 3
Temporary fencing as per Plan No. 2.						
21,120 Lineal yards.....		0 4 0	5,280	0 0	5,280	0 0
Permanent Hedge.						
44,000 Lineal yards at per 100 lineal yards.....		1 0 0	440	0 0	440	0 0
Ballasting.						
In 12 miles 40 Chains.....	69,463	0 8 0	34,731	8 0	34,731	8 0
Laying Permanent way.						
22,000 Lineal yards.....		0 8 0	11,000	0 0	11,000	0 0
Carriage of Materials.						
3,784 Tons.....		1 0 0	7843,	0 0	3,784	0 0
Carriage and laying.						
Rate per lineal yard 0 10 9.						
Contingencies.....					9,985	12 9
Total Co.'s Rupees.....					1,13,000	0 0

	Rupees.	A. P.
Summary of Estimate.		
Bridges.....	18,328	10 0
Culverts.....	6,961	6 0
Metalling of Roads.....	1,629	12 0
Gate.....	250	0 0
Earthwork in roads.....	820	2 0
Do. in Cutting and Embankments.....	19,788	13 3
Fencing.....	5,720	0 0
Permanent way.....	49,515	8 0
Contingencies.....	9,985	12 9
Total Company's Rupees..	113,000	0 0

APPENDIX G 2.

The detailed measurements of certain Bridges, Drains and other works included in the foregoing Estimate.

MADRAS RAILWAY.

21st JUNE, 1853.

DOUBLE 6 FEET ARCH AT 3 MILES 32 CHAINS.

	Length.	Breadth.	Thick.	N	Cub. Ft.	Cub. yds.
Excavation of foundation.....	61.	26.	3.	..	4,758	176- 4
Brickwork.						
Inverts.....	30' 0"	5' 9"	1' 11"	2	388	
Skew back of Piers.....	30' 0"	3' 0"	1' 0"	..	90	
Skew back of abutments.....	30' 0"	2' 9"	1' 0"	2	165	
Counterforts to do.....	3' 0"	2' 0"	1' 0"	8	48	
					691	25- 6
Above Skewback,						
Footings of piers.....	29' 7 1/2"	3' 1 1/2"	1' 0"	..	93	
Do. Abutments.....	29' 7 1/2"	2' 9 1/2"	1' 0"	2	167	
Counterfort to do.....	3' 0"	2' 0"	1' 0"	8	48	
Footings to Wingwalls.....	5' 6"	2' 6 3/4"	1' 0"	4	56	
Do.....	5' 3"	2' 2 1/4"	1' 0"	4	46	
Do.....	2' 4"	1' 9 3/4"	1' 0"	4	17	
Newel.....	2' 4"	2' 4"	1' 0"	4	22	
					449	16- 6
Above Footings.						
Pier.....	29' 0"	2' 6"	4' 5"	..	320	
Abutments.....	29' 0"	2' 6"	4' 6"	2	652	
Counterforts to do.....	3' 0"	2' 0"	4' 9"	8	216	
Wings.....	6' 0"	2' 3"	2' 3"	4	121	
Do.....	11' 3"	2' 6"	1' 10 1/2"	4	210	
Do.....	14' 9"	1' 6"	2' 10"	4	251	
Newel.....	1' 9"	2' 0"	2' 6"	4	35	
					1805	66- 0

Above Springing.	Length.	Breadth.	Thick.	No.	Cub. Ft.	Cub. Yds.
Arch.....	29' 0"	9' 0"	1' 11"	2	587	
Backing to do.	29' 0"	8' 9"	1' 0"	2	169	
Do.	29' 0"	2' 2"	1' 11"	2	241	
Double 6 feet Arch at 3 Miles 32 Chains.					937	108- 20
Counterforts at arch back	3' 0"	2' 0"	1' 5"	8	68	
Spandrills (between arches).....	8' 0"	1' 6"	0' 6"	2	326	
Do. at sides of arches.....	7' 0"	1' 6"	0' 9"	4	32	
Do. above arches.....	23' 6"	1' 6"	1' 0"	2	70	
					1,433	53- 00
String course and coping.....	24' 0"	1' 9"	0' 9"	2	63	
Caps.....	3' 0"	1' 6"	1' 0"	4	18	
Coping on wings.....	14' 2"	1' 6"	0' 4 1/2"	4	32	
Caps to newels.....	2' 0"	2' 0"	0' 8"	4	16	
					123	4- 50
						165- 70

SINGLE 6 FEET ARCH IN A 9 FEET EMBANKMENT.

Excavation of foundation.....	34 0	16 0	2 6	2	1,360	50
Brickwork.						
Invert.....	30 0	5 9	1 1 1/2	2	195	
Skew back of Invert.....	30 0	2 9	1 0	2	175	
Counterforts to do.	3 0	2 0	1 0	8	48	
Above Skew back.					428	15- 8
Footings of abutments.....	29 7 1/2	2 9 3/4	1 0	2	167	
Counterforts to do.	3 0	2 0	1 0	8	48	
Footings to wing walls.....	7 10	2 6 1/2	1 0	4	81	
Do. do.	7 8	2 2 1/4	1 0	4	67	
Do. do.	2 3	1 9 3/4	1 0	4	16	
Newel.....	2 4	2 4	1 0	4	22	
Above footings.					401	14- 8
Abutments.....	29 0	6 1	2 6	2	882	
Counterforts.....	3 0	2 0	6 1	8	292	
Total. { Wing walls.....	7 9	2 3	2 1	4	145	
Do.	14 0	2 9	1 10 1/2	4	288	
Do.	19 0	1 6	2 8	4	285	
Newel.....	1 9	2 0	2 6	4	35	
Above Springing.					1,927	71- 3
Arch.....	29 0	9 0	1 1 1/2	2	293	
Backing to do.	29 0	2 1	2 0	2	242	
Counterfort do.	1 10	2 0	3 0	8	88	
Spandrills.....	7 6	1 6	1 6	2	34	
Do. above crown of Arch.....	15 0	1 3	1 6	2	56	
String course and coping.....	15 6	1 9	0 9	2	41	
Caps.....	3 0	1 6	1 0	4	18	
Coping on wing walls.....	19 0	1 6	0 4 1/2	4	42	
Caps to newels.....	2 9	2 0	0 8	4	11	
					825	30- 5
						132- 4

3 FEET BARREL CULVERT.

Estimated at per lineal yard.

Excavation of foundations } per lined yard exclu-	3- 0	5- 0	2- 6	C. ft.	38
Brickwork..... } sive of wings.	3- 0	13- 0	1- 1 1/2		44
Barrel.....					
Ends of Culvert.					
Excavation of Foundations.....	10- 0	1- 3	2- 0	2	50
Footings to Ends.....	10- 0	1-10 1/2	0- 9	2	28
Do. Walls.....	6- 6	9- 0	1- 6	2	176
Deduct for Area of barrel.....		10- 9		2	21. 6
Coping.....	9- 6	1-10	0- 4 1/2	2	13
					195. 4
Summary.					
Excavation 637 lin. yds. x 38 C. ft. = 896 C. yds.					
do. of Ends 24 x 50 do. = 44 = 940.					
Brickwork 637 x 44 do. = 1038 C. yds.					
do. for Ends 24 x 195 do. = 172 = 1210.					
Total number of 3 feet Culverts, 24					
Total length 637 yards.					
18 Inch Drain per Lineal yard.					
Excavation of Foundations.....	3- 0	3- 9	1- 3		C. feet. 14
Brickwork.					
Brick on edge.....	3- 0	3- 6	0- 4 1/2		3.93
Side walls.....	3- 0	1- 1 1/2	1- 3	2	8
Arch.....	3- 0	3- 6	0- 9		8
Backing to do.	3- 0	0- 9	0- 6	2	2.25
					22.18
Front.....	6- 0	3- 4 1/2	1- 6	2	61
Deduct.....	3- 9	2-10	1- 6	2	32
Coping.....	6- 5	1- 8 1/2	0- 4 1/2	2	8.25
					37-25
Summary.					
Excavation C. ft. 14 x 608 lin. yds. = 315 C. yds.					
Brickwork 22-18 x 608 do. = 498 C. yds.					
do. in Ends 37-25 x 35 do. = 48 = 546 C. yds.					

CANAL BRIDGE.					Cubic Feet.	Cubic Yards.
Excavations of Foundation in Piers	33 0	17 0	5 0	.....	5610 0	
do. in Abutment..	33 0	14 0	7 0	.....	6468 0	
do. in Wings.....	33 6	4 0	2 6	.....	742 6	
					12,820 6	474. 8
<i>Brickwork.</i>						
Wells in Piers.....	280 0		28 x 10	.....	560 0	lineal feet.
do. in Abutment.....	190 0		19 x 10	.....	380 0	do.
do. in Wings.....	70 0		7 x 10	.....	280 0	do.
					1220 0	
Footings of Pier.....	31 8	13 8	3 0	.....	2,596 8	
do. Abutment.....	31 8	12 2	3 0	.....	2,311 6	
do. Wings.....		10 3	3 10 x 20 x 4	.....	314 4	
do. do.....	12 6	3 9	2 0	.....	375 0	
do. do.....	12 3	3 0	2 0	.....	294 0	
do. Newel.....	3 0	3 3	2 0	.....	78 0	
					5,969 0	221
<i>Above Footings.</i>						
Pier.....	29 0	12 0	3 0	.....	2,088 0	
Abutment.....	29 0	11 6	3 3	.....	2,112 2	
Pilasters.....	6 0	3 0	0 6	.....	72 0	
					4,272 2	158. 20
<i>From Springing of Arch.</i>						
Centre Arch.....	29 0	13 0	1 10 1	.....	706 10	
do.	29 0	12 8	2 3	.....	1,653 0	
do.	29 0	11 9	2 7 1	.....	1,759 0	
Backing to large Arch.....	29 0	11 0	7 6	.....	4,785 0	
do. do.....	29 0	14 6	6 3	.....	2,628 0	
Small Arch.....	26 0	29 0	1 10 1	.....	2,863 9	
Backing to do.....	29 0	8 0	9 6	.....	4,464 0	
do. do.....	29 0	6 3	3 7	.....	857 3	
do. do.....	29 0	10 0	5 9	.....	1,667 6	
Spandrills..	40 6	5 0	2 4 1	2	961 10	
do.	41 0	2 9	2 0	4	902 0	
do.	19 3	2 10	2 0	2	218 2	
Pilasters..	15 1 1	6 0	0 6	8	363 0	
Wings..	10 3	3 3	3 2	4	421 11	
do.	12 5	3 0	2 4	4	347 8	
do.	3 6	0 6	2 4 1	4	4 1	
Newels..	2 8	2 0	4 6	4	96 0	
Wings Continued..	10 3	4 6	2 10 1	4	530 6	
do. do..	10 3	4 0	2 6	4	410 0	
do. do..	12 5	3 6	2 7 1	4	456 3	
do. do..	12 5	3 0	2 3	4	335 3	
do. do..	12 3	5 6	2 0	4	539 0	
Caps to Newels..	3 0	2 6	0 9	4	26 6	
Coping to Wingwalls	41 0	1 6	0 4 1	4	92 3	
<i>Frieze Course.</i>						
Under Caps..	6 6	2 9	0 9	8	107 3	
Between Pilasters..	21 3	2 3	0 9	4	143 5	
Over large Arch..	52 9	2 3	0 9	2	178 0	
Carried Forward..					27,491-5	379.20

<i>String Course.</i>		Brought forward.....				27,491-5	379.20
Pilasters	.....	8. 6	3. 9	1. 0	8	235- 0	
Between do	.....	19. 3	3. 3	1. 0	4	250- 3	
Over large Arch	.....	50. 9	3. 3	1. 0	2	329- 10	
Caps	.....	6. 6	2. 9	1. 6	8	214- 6	
						28,541- 0	1053- 5
Plastering Superficial feet.....	180. 0	22. 0	.....	.....	7920. 0		
	31. 0	29. 0	.....	2	899. 0		
Supl. yds..	.....	.....	.....	.....	8819. 0		
					C. yds.	1,437. 25	

<i>BALLAST ESTIMATE.</i>			
<i>Per Mile.</i>			
5280'-0" x 15'. 6" x 1'-10" x 12½	Total 1 Mile.	Total for 12½ Miles.	
	150,040	18,75,500	
	5557 yds.	69,463 yds.	
Laying Rails at per yard.			
Lin. yds. 1760	12½	22,000 lin. yds.	
<i>Carriage of Materials.</i>			
<i>Weight.</i>			
Rails.....	1760 x 84 lbs.	2 x 12½ Miles	3,696,000 lbs. Tons. 1,650
Chairs Joint.....	5280 ÷ 16 x 2 = 660	Miles.	
	660 x	12½ x 30 lbs.	= 82,500 = 111
Single Chairs.....	660 x 4 x 12½ x 18 lbs.	= 594,000 =	265
Sleepers = Chairs ÷ 2, 12 Sleepers = 1 Ton	= 3,300 x 12½ =		1719
Treenails = Chairs x 2 = ½ lb. each	= 12 x 2		
	41,250 x 2 =		19
Kegs = Chairs	4480		
	1 lb. each = 41,250 =		20
	2240		
			3,784 Tons
<i>Permanent Fencing.</i>			
25 Miles in length.			
<i>Temporary Fencing.</i>			
12 Miles lineal (one side.)			
Palmyrahs....	5280	5' 6" long	} at 4 Annas per yard.
Do.	5280	4 6 do.	
Bamboo rails..	5280 x 4 =	21,120	

RAISED ROADS.

<i>Road at 4 miles—16 Chains.</i>								
Metalling.....	150'	0"	20'	0"	0'	9"	2,250	
2 Gates.								
<i>Road at 5 Miles 38 Chains.</i>								
Earthwork.....	30	0	20	0	3	0	2	3,600
do. slopes.....	30	0	6	0	6	0		1,080
								4,680
2 Gates								
Metalling.....	60	0	20	0	0	9		900

APPENDIX G 2. (Continued.)

RAISED ROAD.

Road at 5 Miles 72 Chains.

Metalling..... 50 0 20 0 0 9 * 750
2 Gates.

Road at 8 Miles 72 Chains.

Metalling..... 60 0 10 0 0 9 450

Road at 9 Miles 25 Chains.

Metalling..... 30 0 20 0 0 9 450
2 Gates.

Road at 10 Miles 6 Chains.

Metalling..... 20 0 20 0 0 9 450

Road at 11 Miles 25 Chains.

Metalling..... 60 0 10 0 0 9 450

Road at 12 Miles 10 Chains.

Metalling..... 30 0 20 0 0 9 450
2 Gates.

Road at 11 Miles 40 Chains. 450

EARTHWORK IN APPROACHES.

1 Mile 14 Chains.

Centre—6 × 174 × 20 = 20,880.

Slopes—2 × 6 × 12 × 174 = .. 8,352

29,232 = C. yds. 1082-7.

1 Mile 31 Chains.

Centre—8 × 232 × 20 37,120

Slopes—2 × 8 × 16 × 232 19,797 = 56,917 = 2,108.

1 Mile 72 Chains.

Same as 1 mile 31 chains 56,917 2,108.

2 Miles 12 Chains.

2 Miles 27 Chains.

Centre—3 × 9 × 20 = 5400

Slopes—2 × 3 × 6 × 90 6480 = 210

2 Miles 55 Chains.

3 Miles 23 Chains. (This is an approximation.)

Centre—5 × 300 × 30 = 45,000

Slopes—2 × 5 × 10 × 800 10,000 = 55,000 2037.

3 Miles 76 Chains.

4 Miles 16 Chains.

Cubic yards. 8196.

APPENDIX G. 3.

Memorandum of the quantities of bricks and chunam required for each one of the Masonry works included in the estimate in Appendix G*1, and the quantities required in each mile of the Section.

MADRAS RAILWAY.

QUANTITIES OF BRICKS REQUIRED.

On Section No. 1 District No. 1.

Miles Chains.	Common Bricks.	3 Feet Arch Bricks.	18" Arch Bricks.	Well Bricks.	Chunam Parals.
1 0	3,200	15,400			133
1 30	58,000				406
1 36	53,200				375
1 50	5,75,200			1,86,000	4,025
1 64	53,200				375
1 70	50,400				355
1 72	3,200	24,200			196
	7,96,400	39,600		1,86,000	5,865
2 8	2,400		1,100		25
2 27	3,200	11,000			100
2 46	3,900		2,000		42
2 63	4,400		2,400		49
2 79	3,200	13,200			115
	17,180	24,200	5,500		331
3 15	4,500		2,400		49
3 23	3,200	1,10,000			791
3 32	66,400				465
3 50	3,200	11,000			100
3 62	3,200	11,000			100
3 77	3,900		2,000		42
	84,400	1,32,000	4,400		1,547
4 9	3,900		2,000		42
4 17	3,900		2,000		42
4 24	3,900		2,000		42
4 36	3,900		2,000		42
4 41	3,900		2,000		42
4 51	3,200		13,200		115
4 57	66,400				465
4 62	46,000				822
4 71	3,200		13,200		155
	138,300		36,400		1,227
5 3	3,200	13,200			115
5 40	3,200	35,200			270
5 44	4,200		2,200		45
5 52	4,200		2,200		45
5 62	4,200		2,200		45
5 70	3,200	11,000			100
5 74	3,200	11,000			100
	25,400	70,400	6,600		720

APPENDIX G 3. (Continued.)

Miles	Chains.	Common Bricks.	3 Feet Arch Bricks.	18 Inches Arch Bricks.	Well Bricks.	Chunam Parahs.
6	11	3,490	.....	1,800	.....	30
6	19	3,900	.....	2,000	.....	42
6	45	4,200	.....	2,200	.....	45
		11,590	.....	6,000	.....	117
7	0	4,200	.....	2,200	.....	45
7	10	4,200	.....	2,200	.....	45
7	17	4,200	.....	2,200	.....	45
7	25	4,500	.....	2,400	.....	49
7	38	4,500	.....	2,400	.....	49
7	54	3,200	13,200	.....	.....	115
7	54	4,500	.....	2,400	.....	49
7	59	66,400	.....	.....	.....	465
		95,700	13,200	13,800	.....	862
8	16	3,490	.....	1,800	.....	30
8	19	3,490	.....	1,800	.....	30
8	46	3,200	13,200	.....	.....	115
8	66	5,472	.....	3,000	.....	60
8	72	58,000	.....	.....	.....	406
8	79	53,200	.....	.....	.....	375
		126,852	13,200	6,600	.....	1,016
9	13	3,200	13,200	.....	.....	115
		3,200	13,200	.....	.....	115
10	16	75,600	.....	.....	.....	526
10	34	66,400	.....	.....	.....	465
10	77	75,600	.....	.....	.....	526
		217,600	.....	.....	.....	1,517
11	26	58,000	.....	.....	.....	406
		58,000	.....	.....	.....	406
12	7	6,400	22,000	.....	.....	200
		6,400	22,000	.....	.....	200
<i>Summary.</i>						
Miles..	2d..	7,96,400	39,600	.....	1,86,000	5,865
	3d..	17,180	24,200	5,500	.....	331
	4th..	84,400	132,000	4,400	.....	1,547
	5th..	1,38,300	.....	36,400	.....	1,227
	6th..	25,400	70,400	6,600	.....	720
	7th..	11,590	.....	6,000	.....	117
	8th..	95,700	13,200	13,800	.....	862
	9th..	1,26,852	13,200	6,600	.....	1,016
	10th..	18,200	13,200	.....	.....	115
	11th..	2,17,600	.....	.....	.....	1,517
	12th..	58,000	.....	.....	.....	406
	13th..	6,400	22,000	.....	.....	200
		15,81,022	3,27,800	79,300	1,86,000	13,923

APPENDIX G 4.

The detailed measurements of the Earthwork of one mile of the Section included in the estimate in Appendix G 1, given as a Specimen.

MADRAS RAILWAY.

TABLE SHOWING THE CALCULATIONS OF EARTHWORK IN EACH CHAIN OF THE 5TH MILE.

Mileage.	Tabular number corresponding to Depths.	Depths.	Sum of Depths.	Tabular number corresponding to sum of depths.	Contents of 1 to 1 Slopes.	Content of 2 to 1 Slopes.	Content of centre of 1 foot in width.	Content of centre of 20 feet width.	Total Content.
7-0	9-00	4-70							
1	9-00	4-71	9-41	36-00	54-00	108-00	11-50	230-00	338-00
2	9-00	4-69	9-40	36-00	54-00	108-00	11-49	209-80	317-80
3	8-80	4-64	9-33	35-60	53-40	106-80	11-41	228-20	332-00
4	8-80	4-67	9-31	35-60	53-20	106-40	11-38	227-60	334-00
5	8-80	4-65	9-32	35-60	53-20	106-40	11-39	227-80	334-20
6	9-20	4-75	9-40	36-00	54-00	108-00	11-40	228-80	337-80
7	9-10	4-71	9-46	36-40	54-70	109-40	11-55	231-20	340-00
8	9-00	4-70	9-41	36-00	54-10	108-20	11-50	230-00	338-20
9	8-20	4-50	9-20	34-50	51-70	103-40	11-24	224-80	328-20
10	7-00	4-15	8-65	30-50	45-70	91-40	10-17	211-40	302-80
11	9-80	4-90	9-05	33-40	50-20	100-40	11-66	221-20	321-60
12	10-00	4-95	9-85	39-50	59-30	118-60	12-04	240-80	359-40
13	10-46	5-07	10-02	41-10	61-50	123-00	12-54	244-80	367-80
14	10-60	5-08	10-15	42-00	63-00	126-00	12-51	248-20	374-20
15	10-60	5-08	10-16	42-00	63-20	126-40	12-52	248-40	374-80
16	10-40	5-03	10-11	41-60	62-60	125-20	12-35	247-00	372-20
17	4-60	3-37	8-40	28-70	43-70	87-40	10-27	205-40	302-80
18	5-60	3-67	7-04	29-00	30-20	60-40	8-51	168-20	228-60
19	7-70	4-38	8-36	26-40	39-70	79-40	9-34	196-80	276-20
20	8-20	4-50	8-38	32-30	48-20	96-40	10-38	217-20	313-60
1	9-80	4-89	9-39	36-00	54-00	108-00	11-48	229-60	337-60
2	10-20	4-99	9-88	39-90	59-90	119-80	12-08	241-00	361-40
3	10-60	5-09	10-03	41-60	62-40	124-80	12-50	246-00	370-80
4	8-60	4-59	9-68	38-50	57-50	115-00	11-54	236-80	351-80
5	12-30	5-47	10-06	41-80	62-50	125-00	12-28	245-00	370-60
6	9-40	4-78	10-25	42-80	64-50	129-00	12-53	250-60	379-60
7	12-10	5-43	10-21	42-40	63-90	127-80	12-48	249-00	377-40
8	12-10	5-51	10-91	43-80	73-00	146-00	13-38	267-00	413-60
9	12-80	5-60	11-11	50-20	75-10	150-20	13-58	271-60	421-80
30	13-20	5-68	11-28	52-00	78-00	156-00	13-79	275-80	431-80
1	13-50	5-75	11-43	52-90	79-60	159-20	13-97	279-40	438-60
2	13-50	5-72	11-47	53-40	80-40	160-80	14-02	280-40	441-20
3	12-80	5-60	11-32	52-00	78-30	156-60	13-83	276-60	433-20
4	12-50	5-54	11-14	50-60	75-90	151-80	13-62	272-40	424-20
5	13-00	5-65	11-19	51-10	76-60	153-20	13-68	273-60	426-80
6	13-50	5-77	11-42	52-90	79-40	158-80	13-95	279-00	437-80
7	13-70	5-79	11-56	54-30	81-50	163-00	14-13	282-60	445-60
8	13-90	5-88	11-67	55-30	82-90	165-80	14-26	284-20	450-00
9	13-90	5-86	11-74	56-20	84-00	168-00	14-35	287-00	455-00
40	14-40	5-96	11-81	59-70	86-60	170-60	14-54	288-80	458-80
1	11-10	4-84	11-00	57-70	86-50	173-00	14-54	290-80	463-80
2	14-70	6-02	11-97	58-20	87-50	174-60	14-63	292-60	467-20
3	14-90	6-07	12-10	60-90	90-50	199-00	15-01	320-20	519-20
4	13-50	5-73	11-80	56-70	85-10	170-20	14-42	288-40	458-60
5	13-70	5-80	11-53	54-20	81-50	163-00	14-10	288-20	445-00
6	13-90	5-87	11-67	55-30	82-90	165-80	14-26	291-20	470-00
7	13-70	5-81	11-68	55-80	83-40	166-80	14-28	285-60	452-40
	507-30		485-89	2076-10					18,091-60

Mileage.	Tabular number corresponding to Depths.	Depth.	Sum of Depths.	Tabular number corresponding to sum of Depths.	Contents of 1 to 1 slopes.	Content of 2 to 1 slopes.	Content of centre 1 feet in width.	Content of centre 20 feet wide.	Total content.
7.48	18.00	5.66	11.47	53.40	80.10	160.20	14.01	280.20	440.40
9	13.70	5.81	11.47	53.40	80.10	160.20	14.01	280.20	440.40
50	6.70	4.05	9.86	39.50	59.90	119.80	12.05	241.00	360.80
1	13.50	5.75	9.80	39.10	59.30	118.60	11.98	239.60	348.20
2	11.40	5.29	11.04	49.30	74.20	148.40	13.50	270.00	418.40
3	12.50	5.57	10.86	47.90	71.80	143.60	13.27	265.40	409.00
4	9.60	4.85	10.42	44.00	66.10	132.20	12.73	254.60	386.80
5	11.00	5.20	10.05	41.10	61.70	123.40	12.28	245.60	369.00
6	11.90	5.42	10.62	45.80	68.70	137.40	12.94	258.80	396.20
7	0.00	0.00	5.42	11.90	23.80	47.60	6.62	132.40	180.00
8	16.70	6.40	6.40	16.70	33.40	66.80	7.82	156.40	223.20
9	12.30	5.50	11.90	57.70	86.70	173.40	14.54	290.80	464.20
60	7.50	4.32	9.82	39.10	58.90	117.80	10.78	215.60	433.40
1	6.40	3.96	8.28	28.10	42.00	84.00	10.12	202.40	286.40
2	4.00	3.13	7.09	20.50	30.90	61.80	8.66	173.20	235.00
3	2.50	2.52	5.65	13.00	19.50	39.00	6.91	138.20	177.20
4	2.70	2.54	5.06	10.40	15.60	31.20	6.18	123.60	154.80
5	2.80	2.60	5.14	10.80	16.30	32.60	6.28	125.60	158.20
6	2.90	2.67	5.27	11.20	16.90	33.80	6.44	128.80	162.60
7	2.30	2.39	5.59	10.40	15.60	31.20	6.16	123.20	154.40
8	2.10	2.26	4.65	8.80	13.20	26.40	5.68	113.60	140.00
9	2.10	2.25	4.51	8.20	12.40	24.80	5.51	110.20	135.00
70	3.90	3.13	5.35	11.70	17.70	35.40	6.54	130.80	166.20
1	3.10	2.77	5.87	13.90	20.90	41.80	7.17	143.40	185.20
2	3.10	2.76	5.53	12.50	18.70	37.40	6.75	135.00	172.40
3	3.50	2.97	5.73	13.50	20.10	40.20	7.00	140.00	180.20
4	3.10	2.77	5.74	13.50	20.10	40.20	7.02	140.40	180.60
5	3.00	2.68	5.45	12.10	18.20	36.40	6.66	133.20	169.60
6	2.50	2.50	5.18	11.00	16.50	33.00	6.34	126.80	159.80
7	2.30	2.39	4.89	9.80	14.60	29.20	5.98	119.60	148.80
8	2.10	2.41	4.80	9.40	13.80	27.60	5.87	117.40	145.00
9	2.50	2.50	4.91	9.80	14.40	28.80	5.99	119.80	148.60
8ms.	2.80	2.58	5.08	10.60	15.90	31.80	6.22	124.40	156.20
	180.00		238.37	788.10					8286.20

Summary of 8th mile.

18091.60

8286.20

26,377.80 Cubic yards.

APPENDIX H, 1.

New form for Quarry Book in the Road Department.

QUARRY BOOK OF 1ST DISTRICT OF 1ST DIVISION, WESTERN TRUNK ROAD

FOR THE HALF YEAR ENDING OCTOBER 31st 1852.

(First page.)

(Second page.)

Month and Date	Coolies employed.		Tickets.		Payment made with signature of payer and witness, date and place of payment, &c.
	Men	Women	Received	Disbursed one Ticket for each heap	
1	2	3	4	5	6
1852	Perambator; Laterite.				
June	2	10	16	250	8
	3	13	18	250	12
	4	15	15	0	13
	5	20	20	0	17
	6	19	19	0	15
	7	16	16	0	14
	8	21	21	0	18
	9	20	20	0	16
	10	20	20	0	10
	11	20	20	0	20
	12	23	23	0	20
	14	21	21	0	15
	15	21	21	0	20
	16	20	20	0	17
	17	29	29	0	29
	18	23	23	0	21
	19	42	42	0	40
	333	333	500	201	
Brought forward	199				
	Perambator; Laterite.				
	23	35	35	301	33
	24	33	33	0	31
	25	31	31	0	30
	26	40	40	0	37
	27	45	45	0	40
	28	30	30	0	28
	29	30	30	0	28
	244	244	500	227	
July 10th. Counted, measured and paid by me at Perambator viz. 227 heaps of Laterite of 13 Pans or 4356 Pans at Annas 3-3 per heap. Rs. 48-1-9	(Sgd.) J. HOPKINS, Asst. Overseer. (Sgd.) SUNKARALINGUM, P. SGT.				
	Bementhongul; Laterite.				
July	3	20	20	227	18
	4	20	20	0	20
	5	22	22	0	21
	6	24	24	0	22
	7	24	24	0	23
	8	25	25	0	23
	9	25	25	0	24
	10	25	25	0	25
	12	25	25	0	22
	13	28	28	0	23
	14	30	30	0	23
	15	32	32	0	30
	16	30	30	0	50
	17	52	52	0	50
	18	58	58	0	57
	19	60	60	0	53
	20	25	25	0	23
	Perambator; Gravel.				
	21	0	0	0	45
	Bementhongul; Laterite.				
	22	33	33	500	32
	24	56	56	45	56
	25	74	74	0	72
	26	79	79	0	76
	27	82	82	0	80
	28	85	85	0	84
	29	88	88	0	85
	30	15	15	0	15
	1038	1038	1045	1045	
August 1st. Counted but not finding the right measurement the number of heaps is reduced and gravel also is not paid for. The payment is therefore made as follows at Bementhongul. 973 heaps of Laterite of 13 Pans or 17514 Pans at Annas 3-3 per heap. Rs. 107-10-9	(Sgd.) J. HOPKINS, Asst. Overseer. (Sgd.) SUNKARALINGUM, P. SGT.				

APPENDIX H. 2.

New form for Cartage Book in the Road Department.

CARTAGE BOOK OF 2D DISTRICT OF THE 1ST DIVISION, WESTERN TRUNK ROAD

FOR THE HALF YEAR ENDING OCTOBER 31st 1852.

(First page.)

(Second page.)

Month and Date.	To what mile.	No. of carts employed.	At what trip per cart.	Total loads.	Tickets.		Payment made with signature of payer and witness; date and place of payment &c.
1	2	3	4	5	Received.	Disbursed.	
1852							
Aug.	6 13	8 2		16	300	8	Counted, measured and paid by me at Coonnatoor viz. 762 tickets for 1009 loads of stone at 6 Annas per ticket Rs. 285-12-0 SEPTEMBER 8TH.—(Signed) J. HOPKINS, Assistant Overseer.
	7	8		16	0	8	
	9	6		12	300	6	
	10	8		16	300	8	
	11	6		12	0	5	
	12 12	10 1 1/2		15	0	10	
	13	20		30	0	20	
	14	20		30	0	20	
	16	20		30	0	20	
	17	20		30	0	20	
	18	20		30	0	20	
	19	20		30	0	20	
	20	20		30	0	20	
	21	20		30	0	20	
	23	28		42	0	28	
	24	32		48	0	32	
	25	34		51	0	34	
	26	30		45	0	30	
	27	30		45	0	30	
	28	44		66	0	44	
	30	44		66	0	44	
	31	30		45	0	30	
Sep.	1	40		60	0	40	
	2	32		48	0	32	
	3	4		6	0	4	
	11	44 14		55	0	44	
	4	56		70	0	56	
	6	56		70	0	56	
	7	52		65	0	52	
		762	1009	900	762		
		Brought forward			138		
	10 11	80 14	100	560	80		
	11	44	55	600	44		
	13	56	70	452	56		
	14	60	75	0	60		
	15	60	75	0	60		
Carrd. fd.	300	375	1750	300			

Month and Date.	To what mile.	No. of carts employed.	At what trip per cart.	Total loads.	Tickets.		Payment made with signature of payer and witness; date and place of payment &c.
1	2	3	4	5	Received.	Disbursed.	

APPENDIX H. 3.

New form for the Road Book, in the Road Department.

ROAD BOOK OF 1ST DISTRICT OF THE 1ST DIVISION OF WESTERN TRUNK ROAD FOR THE HALF YEAR ENDING 31ST OCTOBER 1852.

Month and date.	No. of coolies employed.		Earthwork.		Gravel dug.		Spreading jelly.		Repairing road such as watering, stamping, leveling, &c.		Hedging trees.		Cutting Channel.		Sundry labour.	Tickets.		Payment made with signature of payer and receiver; date and place of payment, &c.											
	Miles.	Men.	Women.	M. W.	Cub. yds.	M. W.	Cub. yds.	No. of keeps.	No. of	M. W.	Sq. yds.	M. W.	No. of trees.	M. W.		Cub. yds.	M. W.		M.	W.									
																					Received.	Disbursed.							
1		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1852																													
May.	6	9	10	10																									
"	7	10	11	11																									
"	8	10	11	11																									
"	9	10	11	11																									
"	10	10	11	11																									
"	11	10	11	11																									
"	12	10	11	11																									
"	13	10	11	11																									
"	14	10	11	11																									
"	15	10	11	11																									
"	16	10	11	11																									
"	17	10	11	11																									
"	18	10	11	11																									
"	19	10	11	11																									
"	20	10	11	11																									
"	21	10	11	11																									
"	22	10	11	11																									
Carried fwd.	1219	222	19	22	100																								

[illegible]

APPENDIX H. 4.

Form for the Roll of Labourers Employed on Monthly Wages, to be written at an end of the Road Book.

ACQUITTANCE ROLL OF MEN AND WOMEN &C. EMPLOYED ON MONTHLY PAY FOR WATERING
TREES IN THE 1ST DISTRICT OF THE 1ST DIVISION OF No. 1 TRUNK ROAD
DURING THE MONTH OF MAY 1852.

NAMES.	Rate of pay per Month.	Date when discontin- ed.	Dates on which the parties were absent.	No. of days for which pay is due.	Amount due.	Date of pay- ment by the Overseer.
<i>Remaining on work on 1st May as brought from the last Roll</i>						
Alwar.....	2 8		24th.....	30	2 6 8	5th June.
Bashier.....	2 8			31	2 8 0	5th do
Cooppen.....	2 8			31	2 8 0	5th do.
Ramen.....	2 8			31	2 8 0	5th do.
Moottan.....	2 8			31	2 8 0	5th do.
Soobben.....	2 8	25th	9th 20th 23d..	22	1 12 5	14th do.
Vurdun.....	2 8	25th	19th 22d 23d 24th	21	1 11 1	5th do.
Lutchmee.....	2 0			31	2 0 0	5th do.
Chelly.....	2 0			31	2 0 0	5th do.
Veerec.....	2 0			31	2 0 0	14th do.
Cooppee.....	2 0			31	2 0 0	5th do.
Soobie.....	2 0	25th	10th 15th 20th.	22	1 6 9	5th do.
Meenatchy.....	2 0	25th		25	1 9 9	5th do.
<i>Employed on the 20th.</i>						
Kistnen.....	2 8		28th.....	11	0 14 2	5th do.
Valau.....	2 8			12	0 15 6	5th do.
Soondrum.....	2 8			12	0 15 6	5th do.
Umnee.....	2 0			12	0 12 4	5th do.
Sashce.....	2 0		26th 29th.....	10	0 11 4	5th do.
Balee.....	2 0			12	0 12 4	5th do.
Total Company's Rupees..					31 14 10	

APPENDIX H, 5.

New form for the Roller Book in the Road Department.

ROLLER BOOK OF 1ST DIVISION OF NO. 1 TRUNK ROAD FOR THE HALF YEAR ENDING
31ST OCTOBER 1852.

(1st Page.)

(2d Page.)

Month and Date.	Pairs of Bullocks.	From what Mile.	To what Mile.	On what Mile actually employed.	Number of trips.	Payment made with signature of payer and witness; date and place of payment &c.
1852 June 15	3	27	29	0	2	Payment made with signature of payer and witness; date and place of payment &c. (Signed) J. E. HOPKINS, Assistant Overseer Road Department.
" 16	3	27	29	0	2	
" 17	3	27	29	0	2	
" 18	3	27	29	0	2	
" 19	3	27	29	0	2	
" 20	3	27	29	0	2	
" 21	3	27	29	0	2	
" 22	3	15	10	0	3	
" 23	3	10	0	10	12	
" 24	3	10	0	10	12	
" 25	3	10	0	10	12	
" 26	3	10	0	10	12	up to the end of the Month. Viz. at 30 Rupees for 3 pairs of Bullocks and at 36 Rupees for 4 pairs per Month Rupees 48 5 4 (Signed) J. E. HOPKINS, Assistant Overseer Road Department.
" 27	3	10	0	10	12	
" 28	3	10	0	10	12	
" 29	3	10	12	0	4	
" 30	3	10	12	0	4	
July 1	3	10	12	0	4	
" 2	3	10	12	0	4	
" 3	3	10	12	0	4	
" 4	3	10	12	0	4	
" 5	3	10	12	0	4	
" 6	3	10	12	0	4	
" 7	3	10	12	0	4	
" 8	3	10	21	0	0	
" 9	3	21	0	21	12	Paid at (Signed) LUTCHMANA NAIR.
" 10	4	21	0	21	12	
" 11	0	0	0	0	0	
" 12	4	21	0	21	12	
" 13	4	21	0	21	12	
" 14	4	21	0	21	12	
" 15	4	21	27	27	3	
" 16	4	26	29	29	3	
" 17	4	26	29	29	3	
" 18	0	0	0	0	0	
" 19	3	26	29	29	3	Paid at (Signed) LUTCHMANA NAIR.
" 20	4	26	27	27	3	
" 21	4	26	21	21	3	
" 22	4	21	0	21	12	
" 23	4	21	12	0	3	
" 24	3	12	10	0	10	
" 25	0	0	0	0	0	
" 26	4	10	12	0	10	
" 27	4	12	0	12	10	
" 28	4	12	0	12	10	
" 29	4	12	12 & 10	0	10	Paid at (Signed) LUTCHMANA NAIR.
" 30	4	10	6 & 12	0	2	
" 31	4	12	0	12	10	
" 31	4	12	0	12	10	

September 1st paid at
for 4 pairs of bullocks for the month of August
at Rupees 9 per pair. (Signed) J. E. HOPKINS, Assistant Overseer Road Department.
(Signed) LUTCHMANA NAIR.

October 2d paid at
for 4 pairs at 9 Rupees each. 7 Rupees 19-4-3
per Month. (Signed) J. E. HOPKINS, Assistant Overseer Road Department.
(Signed) LUTCHMANA NAIR.

APPENDIX H, 6.

New Form for the Establishment Book.

ACQUITTANCE ROLL OF THE ESTABLISHMENT EMPLOYED IN THE 1ST DIVISION OF THE
WESTERN TRUNK ROAD NO. 1 FOR JULY 1852.

NAMES.	Rank.	Amount of Pay.	Fines.	Amount actually Drawn.	Date of Payment.	Signature of the Parties.
2nd Corporal J.E. Hopkins.....	Assistant Over-seer.....	43 15 1	0 0 0	43 15 1	1st Aug 1852	
Vencatasoobiah.....	Writer.....	10 0 0	0 0 0	10 0 0	do.	
Aurmoogum.....	do.	10 8 0	0 0 0	10 8 0	do.	
Sillar Saib.....	Pygust.....	14 0 0	0 0 0	14 0 0	do.	
P. Murray.....	do.	10 8 0	0 0 0	10 8 0	do.	
Subbapathy.....	do.	8 0 0	0 0 0	8 0 0	do.	
Kistnah.....	do.	12 0 0	0 0 0	12 0 0	do.	
Moorgassa.....	do.	8 0 0	0 0 0	8 0 0	do.	
Soobaroy Pillay.....	Cart Conacapillay	7 0 0	0 0 0	7 0 0	do.	
Cundasawmy.....	do.	7 0 0	0 0 0	7 0 0	do.	
Rungiah.....	do.	7 0 0	0 0 0	7 0 0	do.	
Soobaroy Moodly.....	do.	7 0 0	0 0 0	7 0 0	do.	
Soobaroy Naick.....	Dy. do.	8 0 0	0 0 0	8 0 0	do.	
Ragavaloo.....	do.	6 0 0	0 0 0	6 0 0	do.	
Vencatachellum.....	do.	7 0 0	0 0 0	7 0 0	do.	
Lutchmen.....	do.	5 0 0	0 0 0	5 0 0	3rd do.	
Nursiah.....	Dy. Pygust.....	6 0 0	0 0 0	6 0 0	do.	
Ramakistna.....	do.	6 0 0	0 0 0	6 0 0	do.	
Boochien.....	do.	5 0 0	0 0 0	5 0 0	do.	
Sheikammun.....	do.	6 0 0	0 0 0	6 0 0	do.	
Vencatarungum.....	do.	6 0 0	0 0 0	6 0 0	2d do.	
Lutchmen.....	Roller C.....	8 0 0	0 0 0	8 0 0	do.	
Arnoochellum.....	Apprentice.....	3 8 0	0 0 0	3 8 0	do.	
Vencatasawmy.....	Qy. Conacapillay	7 0 0	0 0 0	7 0 0	do.	
Alasoo.....	do.	7 0 0	0 0 0	7 0 0	do.	
Sunkerlingum.....	do.	7 0 0	0 0 0	7 0 0	do.	
Mooneasawmy.....	do.	6 0 0	0 0 0	6 0 0	do.	
Sasheo.....	do.	6 0 0	0 0 0	6 0 0	do.	
Tevarkarum.....	do.	7 0 0	0 0 0	7 0 0	do.	
Rungiah (No. 2).....	do.	6 0 0	0 0 0	6 0 0	do.	
Runganatha Reddy.....	do.	6 0 0	0 0 0	6 0 0	4th do.	
Mooneasawmy.....	Peon.....	4 8 0	0 0 0	4 8 0	do.	
Syder Hyder.....	Lascar.....	6 0 0	0 0 0	6 0 0	do.	
Reman Khan.....	do.	7 0 0	0 0 0	7 0 0	7th do.	
Varaden.....	Head Cooly.....	6 8 0	0 0 0	6 8 0	6th do.	
Venkatasoo.....	do.	6 8 0	1 0 0	5 8 0	do.	
Hoossain Saib.....	do.	6 8 0	0 0 0	6 8 0	do.	
Veerasawmy.....	do.	6 8 0	0 0 0	6 8 0	do.	
Kistnen.....	do.	6 8 0	0 0 0	6 8 0	do.	
Total Co's Rupees.		313 7 1	1 0 0	312 7 1		

1st August 1852.

(Signed) J. E. HOPKINS,

Asst. Overseer.

APPENDIX H. 7.

(New Form for the Overseer's Cash Book in the Road Department.)
CASH ACCOUNT OF 1ST DIVISION OF NO. 1 TRUNK ROAD FOR THE HALF YEAR
ENDING 31ST OCTOBER 1852.

(J. E. HOPKINS, Asst. Overseer in Charge.)

Month and Date.	Description of Charges.	Amount.	Amount of daily total.
1852 May	1 Balance in hand.....	44 7 11	
	Amount of a cheque No. 6 of 1852-53 received from the Superintendent of Roads drawn on the Tasildar of Poonamalle.....	800 0 0	
	Total balance.....	844 7 11	
	4 117 Heaps of laterite at 3 annas and 3 pice per heap as per Quarry Book No. 1.....	23 12 3	
	184 Heaps of stone at 2 annas and 2 pice per heap as per do.....	24 14 8	
	86 Carts employed in conveying stones at 6 annas per cart as per Cartage Book No. 1.....	32 4 0	
	180 Carts employed in conveying laterite at 6 annas per cart as per do.....	67 8 0	
	496 Carts employed in conveying gravel at 6 annas per cart as per do.....	186 0 0	
	459 Men for earth work at 2 annas and 2 pice each as per Road Book No. 1.....	62 2 6	
	500 Women for do at 1 anna and 1 pice each as per do. No. 1..	33 13 8	
	Pay of the Establishment for April as per Acquittance Roll..	153 15 1	
	Balance.....	584 6 2	
	As per Chittoor Bridge Book.		
	153 Bricklayers at 5½ annas each.....	1 0 6	
	1 do at 3 do do.....	3 0 0	
	180½ Men at 2 do do.....	22 9 0	
	196½ Women at 1½ do do.....	15 5 7	
	206-14 Cubic Yards Rough Stone at 7 annas per Cubic Yard.	90 8 1	
	Balance.....	129 10 2	
	20 One Blank Memorandum Book as per Receipt No 1.....	3 0 0	
	163 Chatties for road work at different rates.....	2 4 9	
	For repairing 6 iron crowbars for do. as per receipt No. 2....	3 1 0	
	Paid in advance to Ramasawmy for supplying chunam for do. at 18 paras per pagoda as per receipt No. 3.....	2 0 0	
	Balance.....	10 5 9	
	Balance.....	120 1 10	
June	6 Amount of a cheque No 9 of 1852-53 received from the Superintendent of Roads.....	700 0 0	
	Total balance.....	820 1 10	

APPENDIX H. 7. (Continued.)

Month and date.	Description of charges.	Amount.	Amount of daily total.
1852	Brought forward.....	820 1 10	
June.	18 227 Heaps of Gravel at 3 annas 3 pice per Heap as per Quarry Book No. 2.....	46 1 9	
	1292 Carts employed in conveying Gravel at 6 annas per cart as per Cartage Book No. 2.....	484 8 0	
	410 Carts employed in conveying Laterite at 6 annas per do. as per do.....	153 12 0	
	Balance.....	684 5 9	
	As per Chittoor Bridge Book.		
	20 15 Bricklayers at 5½ annas each.....	5 2 6	
	25 do at 5 do do.....	7 13 0	
	13½ do at 4 do do.....	3 6 0	
	213 Men at 2 do do.....	26 10 0	
	216 Women at 1½ do do.....	16 14 0	
	Balance.....	59 13 6	
	Amount of a cheque No. 23 of 1852-53 received from the Superintendent of Roads.....	75 14 7	
	600 0 0		
	Total balance.....	675 14 7	
	As per Chittoor Bridge Book.		
	26 3 Bricklayers at 5½ annas each.....	1 0 6	
	6 do at 3 do do.....	1 2 0	
	100 Men at 2 do do.....	12 8 0	
	200 Women at 1½ do do.....	15 10 0	
	Pay of the Establishment for May as per Acquittance Roll... 204 0 0		
	26 yards of Europe Cloth as per Receipt No. 4.....	4 0 0	
	Balance.....	238 4 6	
	30 500 Heaps of stone at 2 annas 2 pice per Heap as per Quarry Book No. 1.....	67 11 4	
	652 Carts employed in conveying stones at 6 annas per cart as per Cartage Book No. 1.....	244 8 0	
	27 Paras of Chunam for road work at 18 Paras per Pagoda as per Receipt No. 5.....	5-4-0	
	Deduct advance made on the 20th May.....	2-0-0	
	Paid this day as per Receipt No. 6....	3 4 0	
	5 New Hammers at Rupees 1-8 per each as per Receipt No. 7	7 8 0	
	10 Iron Crowbars at Rupees 1-0-0 per each as per do do.	10 0 0	
	Balance.....	332 15 4	
	As per Chittoor Bridge Book.		
July	5 90 Bricklayers at 4 annas each.....	22 8 0	
	80 do at 3 do do.....	15 0 0	
	55050 Bricks at Rupees 1-12-0 per 1000.....	61-5-4	
	Deduct advance made in the previous half year.....	30-0-0	
	Paid this day as per Receipt No. 8....	31 5 4	
	Carried forward.....	68 13 4	
	104 10 9		

Month and date.	Description of Charges.	Amount.	Amount of daily total.
1852 July	Brought forward..	68 13 4	101 10 9
5	Leather Rope for the use of Picotta ^h	0 2 0	
	6 Mud Pots and 60 Chatties at different rates.....	0 15 0	
	Coir Rope.....	1 6 0	
			71 4 4
	Balance.....		33 6 5
10	Amount of a Cheque No. 7 of 1852-53 received from the Superintendent of Roads.....		700 0 0
	Total Balance.....		733 6 5
	692 Heaps of Laterite at 3 annas 3 pice per heap as per Quarry Book No. 2.....	119 9 0	
	12 Heaps of Gravel at 3 annas 3 pice per heap as per do.....	2 7 0	
	762 Carts employed in conveying Laterite at 6 annas per Cart as per Cartage Book No. 3.....	285 12 0	
	455 Men for Earth Work at 2 annas 2 pice each as per Road Book No. 2.....	61 9 10	
	509 Women for do at 1 anna 1 pie each as per do.....	34 7 5	
	Pay of the Establishment for June as per acquittance roll.....	60 0 0	
	2½ Candies of Iron purchased for making Sledgers as per Receipt No. 9.....	50 0 0	
	Advanced to Rungasawmy for supplying Chunam for Bridge Work at 18 paras per Pagoda as per Receipt No. 10.....	30 0 0	
	20 Mud Pots and Coir Rope for road work.....	1 2 0	
			665 15 3
	Balance.....		67 7 2
15	Amount of a Cheque No. 13 of 1852-53 received from the Superintendent of Roads.....		500 0 0
	Total Balance.....		567 7 2
	<i>As per Chittoor Bridge Book.</i>		
	60 Bricklayers at 4 annas each.....	15 0 0	
	6 Carpenters at 4 annas each.....	1 8 0	
	20 Sledger hammers at 12 annas each.....	15 0 0	
	For repairing 28 crowbars and 16 hammers for bridge work..	17 8 0	
	Advanced to Ramasawmy for constructing rough stones at Rupees 1-12 per 1000 as per receipt No. 11.....	30 0 0	
			79 0 0
	Balance.....		488 7 2
	Advanced to Rungasawmy for supplying Chunam for Bridge work at 18 paras per Pagoda as per Receipt No. 12.....	6 0 0	
20	598 Men for Earth Work at 2 annas 2 pice each as per Road Book No. 3.....	72 13 8	
	692 Women for do at 1 anna 1 pie each as per do.....	46 13 8	
	Extra establishment employed in June for sundry labour as per Road Book No. 2.....	50 0 0	
	Hire for conveying money from Conjeevaram to Poonamallee.	2 12 0	
	Do. for repairing 28 Crowbars for Road Work.....	10 0 0	
			188 7 4
	Balance.....		299 15 10

Month and Date.	Description of Charges.	Amount.	Amount of daily total.
	Brought forward.....		299 15 10
1852. Aug.	<i>As per Chittoor Bridge Book.</i>		
	691-6 Cubic Yards Rough Stone at 6 annas per Cubic Yard.....	34 4 4	
	Deduct advance made on the 15th July.....	30 0 0	
	Paid this day as per Receipt No. 13..	4 4 4	
	8 Carpenters at 4 annas each.....	2 0 0	
	22 Bamboo Mats at different rates.....	8 0 0	
	Hire for repairing 15 Iron Crowbars.....	3 0 0	
	Cost of erecting a Shed.....	12 0 0	
	Mud Pots and Coir Ropes.....	1 8 0	
			30 12 4
	Balance.....		269 3 6
	8 Pay of the Establishment for July as per Acquittance Roll..	120 0 0	
	Hire for Bullocks employed for Road Work as per Roller Book.....	28 0 0	
	8 Quires of Foolscap Paper at 2 a. 9 p. per Quire.....	1 6 0	
	Paste Board.....	0 8 0	
	Advanced to Ramen for supplying Bricks at Rs. 1-12-0 per 1000 as per Receipt No. 14.....	10 0 0	
	Hire for conveying money from Conjeeveram to Poonamallee.	2 8 0	
			162 6 0
	Balance.....		106 13 6
16	Amount of a cheque No. 17 of 1852-53 received from the Superintendent of Roads.....		500 0 0
	Total Balance.....		606 13 6
	538 Men for Earth Work at 2 a. 2 p. each as per Road Book No. 3.....	72 13 8	
	692 Women for do. at 1 a. 1 p. each as per do.....	46 13 8	
	Hire for Bullocks employed for Road Work as per Roller Book.....	13 0 0	
			132 11 4
	Balance.....		474 2 2
	<i>As per Chittoor Bridge Book.</i>		
20	221 Bricklayers at 5½ annas each.....	7 11 9	
	191 do at 3 do.....	3 10 6	
	302 Men at 2 do.....	37 12 0	
	250 Women at 1½ do.....	19 8 6	
	267½ Paras of Chunam at 18 paras per Pagoda.....	52-1-0	
	Deduct advance made on the 10th July.....	30-0-0	
	Paid this day as per Receipt No. 15.....	22 1 0	
			90 11 9
	Balance.....		383 6 5
Sept.	16 Pay of the Establishment for August as per acquittance Roll..	60 0 0	
	762 Carts employed in conveying Stones at 6 Annas per Cart as per Cartage Book No. 2.....	285 12 0	
			345 12 0
	Balance.....		37 10 5

Month and Date.	Description of Charges.	Amount.	Amount of daily total.
1852	Brought forward.....	37 10 5	
Sept 25	50 Heaps of Laterite at 3 a. 3 p. per heap as per Quarry Book No. 2.	10 2 6	
	12 Carts employed in conveying do. at 6 annas per Cart as per Cartage Book No. 2.....	4 8 0	
	Advanced for Chinam to Rungasawmy for Road Work as per Receipt No. 16.....	15 0 0	
	145 Chitties for do. at different rates.....	1 12 0	
	Balance.....	31 6 0	
29	Amount of a Cheque No. 15 of 1852-53 received from the Superintendent of Roads.....	600 0 0	
	Total Balance.....	600 3 11	
	As per Chittor Bridge Book.		
	17525 Bricks at Rs. 1 12-0 per 1000..... Rs. 30-10-8		
	Deduct advance made on the 8th August 1852..... 10-0-0		
	Paid this day as per Receipt No. 17.....	29 10 8	
	151 Men at 2 annas each.....	15 14 6	
	125 Women at 1 1/2 do.....	9 13 3	
	20 Ladies at different rates.....	0 14 0	
	Balance.....	50 2 11	
Oct 15	Hire for Bullocks employed for Road Work as per Roller Book No. 2.....	32 0 0	
	20 Heaps of Gravel at 3 a. 8 p. per heap as per Quarry Book No. 2.....	4 1 0	
	14 Heaps of Laterite at 3 a. 3 p. per heap as per do.....	2 13 6	
	10 Heaps of Stone at 2 a. 2 p. per heap as per do.....	1 5 9	
	18 Carts employed in conveying Laterite at 6 annas per Cart as per Cartage Book No. 2.....	6 12 0	
	20 do. employed in conveying Gravel at 6 annas per do. as per do.....	7 8 0	
	68 Men for Earth Work at 2 a. 2 p. as per Road Book No. 3.....	9 3 4	
	40 Women for do. at 1 a. 1 p. as per do.....	2 11 4	
	12 Quires of Foolscap paper.....	2 12 0	
	Paste Board.....	0 8 0	
	Hire for repairing 29 Iron Cravbars for Road Work as per Receipt No. 18.....	5 4 0	
	Pay of the Establishment for September as per Acquittance Roll.....	65 2 0	
	Balance.....	208 0 2	
20	Amount recovered from Rungasawmy Chinam Contractor being the balance outstanding against him, out of the advance made to him on 25th September 1852.....	10 0 0	
	Total Balance.....	400 0 2	
	As per Chittor Bridge Book.		
	30 Bricklayers at 5 annas each.....	9 6 0	
	15 do at 4 1/2 do do.....	4 3 6	
	20 do at 4 do do.....	5 0 0	
	15 do at 6 do do.....	2 13 0	
	20 do at 2 do do.....	2 8 0	
	20 Women at 1 1/2 do do.....	1 9 6	
	Hire for making 12 New Sledgers.....	2 0 0	
	Mud Pots and Coir Ropes for Bridge work.....	1 4 0	
	Balance.....	374 4 8	

APPENDIX H. 8.

Form of the Abstract for Road work, abstracted from the Cash Book in Appendix H. 7.

Month and Date.	COLLECTION OF MATERIALS.				CARTAGE OF MATERIALS.				EARTH WORK, &c.				SUNDRIES.				Total.				
	Stone at Rs. 0-2-2		Laterite at Rs. 0-3-3		Gravel at Rs. 0-3-3		Stone at 6 Annas.		Laterite at 6 Annas.		Gravel at 6 Annas.		Men at Rs. 0-2-2		Women at Rs. 0-1-1			Repairs of Iron Tools and Implements.	Items as per Partition less below given.	Small Items under 6 Rupees each.	
	Amount.	Heaps.	Amount.	Heaps.	Amount.	Carts.	Amount.	Carts.	Amount.	Carts.	Amount.	Carts.	No. Amount.	No. Amount.							
1852	No. R. A. P.	No. R. A. P.	No. R. A. P.	No. R. A. P.	No. R. A. P.	No. R. A. P.	No. R. A. P.	No. R. A. P.	No. R. A. P.	No. R. A. P.	No. R. A. P.	No. R. A. P.	No. R. A. P.	No. R. A. P.	No. R. A. P.	No. R. A. P.	No. R. A. P.	No. R. A. P.	No. R. A. P.	No. R. A. P.	
May.	4184 14 4	8117 3	927 46 1	86 32 4	67 8	490 186 7	459 62 2	500	33 13 8	500	33 13 8	500	33 13 8	500	33 13 8	500	33 13 8	500	33 13 8	500	33 13 8
June.	30 500 67 11	4	927 46 1	9	652 244 5	410 153 12	1292 484 8	8	455 61 9	10 500	34 7 5	500	34 7 5	500	34 7 5	500	34 7 5	500	34 7 5	500	34 7 5
July.	10	602	12 2 7	8	762 285 12	762 285 12	538 72 13	8	538 72 13	8	46 13 8	692	46 13 8	692	46 13 8	692	46 13 8	692	46 13 8	692	46 13 8
Aug.	8																				
Sept.	16																				
Oct.	15	10 1 5 14	218 6 20	4 1	13 6 12	20 7 8	538 72 13	5	538 72 13	5	46 13 8	692	46 13 8	692	46 13 8	692	46 13 8	692	46 13 8	692	46 13 8
	694 93 15	8 873	177 53	259 52 9	8 1332 518	41808 678	2058 278 11	2493	184 11	9 93	184 11	9 93	184 11	9 93	184 11	9 93	184 11	9 93	184 11	9 93	184 11

Particulars of the Charges for Sundries exceeding 5 Rupees each, (to be given on the back of the Abstract.)

1852

June, 30th.—37 Pans of Churnam at 18 Pans per Pagoda for repairing masonry works..... 5-4-0

July 5th.—Labourers employed on monthly wages..... 50-0-0

OCTOBER 18th.—251 Pans of Churnam at 18 Pans per Pagoda for repairing masonry works..... 5-0-0

Settled on 15th October 1852 for 224 Pans. The difference between 10-0-0 recovered on the 20th October 1852. See Cash Book of that date.

Particulars of the Charges for Sundries exceeding 5 Rupees each, (to be given on the back of the Abstract.)

Month and Date.	Amount of advance.	Nature of Advance.	Remarks.
1852			
June 30	500	Advanced to Rungasawmy for supplying Chinam at 10 Paras per Pagoda	Settled on 15th October 1852 for 254 Paras. The difference Rupees 10-0-0 recovered on the 20th October 1852. See Cash Book of that date.
Sept. 25	10	Do. to do. for do. at do. do.	

59

(GENERAL DEPARTMENT.)

(REPAIR.)

PUBLIC ROADS.

BILL NO. 1 OF 1852-53.

Road No. 1 Trunk Road--1st Division.

Work—Repairing Road from 4th to 33d mile, during the half year ending 31st October 1852.

Description of Charges.	Amount.	Total.
	Rs. A. P.	Rs. A. P.
<i>Collection of Materials.</i>		
624 Heaps of stone at 2 annas and 2 Pice per Heap.....	93 15 8	
873 do. of Laterite at 3 A. 3 P. per do.....	177 5 3	
259 do. of Gravel at 3 A. 3 P. per do.....	52 9 9	
		323 14 8
<i>Cartage of Materials.</i>		
1500 Carts for conveying stones at 6 annas per cart.....	562 8 0	
1382 do. for do. Laterite at do. do.	518 4 0	
1808 do. for do. Gravel at do. do.	678 0 0	
		1,758 12 0
<i>Earth Work &c.</i>		
2058 Men at 2 annas and 2 Pice each.....	278 11 0	
2493 Women at 1 anna and 1 Pice each.....	164 11 9	
		443 6 9
Hire of Bullocks employed for the Roller.....		93 0 0
Labourers employed on Monthly wages.....		50 0 0
<i>Sundry Charges.</i>		
For repairing Iron Tools and Implements.....	13 5 0	
524 Paras of Chunam for repairing Masonry works at 18 Paras per Pagoda.....	10 4 0	
Small Items below 5 Rupees each.....	5 2 9	
		33 11 9
Company's Rupees.....		2,702 13 2

Poonamally,
8th November 1852.

(Signed,) A. B.
Assistant Overseer:

SECRET

NEW FORM FOR THE BRIDGE BOOK.

Station Book of the Bridge No. 46 of 5 yards on 84th mile from 29th May 1852.

[illegible]

NOTE.—The accounts of chuzam and other materials should be in similar form.

APPENDIX I, 3.

Form for the Daily Register of people employed and work done.
Report of the Bridge No. 46 of 5 yards span in the 84th mile from 29th May 1852.

Date.	Labourers employed.								Materials received.		Work performed.					
	Bricklayers.	Carpenters.	Stone cutters.	Black smiths.	Task work.		Cooly work.		No. of bricks.	Papas of chunam.	Earth work C. yards.	Masonry.				
					Men.	Women.	Men.	Women.				Length.	Breadth.	Thickness.	C. yards.	
1.	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
1852.																
May,	29	0	0	0	0	7	9½	0	0	0	0	0	0	0	0	
	30	0	0	0	0	6	6	3½	0	0	0	0	0	0	0	
	31	0	0	0	0	6	6	4	0	0	0	0	0	0	0	
		0	0	0	0	19	21½	7½	0	0	0	0	0	0	0	
June,	1	0	0	0	0	0	14	18	0	0	0	0	0	0	0	
	2	0	0	0	0	14	20	7	0	75	0	0	0	0	0	
	3	0	0	0	0	23	23	7	0	0	0	0	0	0	0	
	4	0	0	0	0	20	21	10	0	0	0	12-10	2-4	0-6½	11-8	
	5	1	0	0	0	18	20	8	0	0	0	4-0	2-0	0-6½	6-8	
	6	1	0	0	0	0	0	6	0	0	0	12-6	2-0	0-7	10-13	
	7	2	0	0	0	17	21	10	0	0	0	4-0	1-12	0-7	6-2	
	8	2	0	0	0	8	22	18	0	0	50	12-2	1-12	0-6	7-15	
	9	2	0	0	0	16	22	12	0	0	86	4-0	1-8	0-6	4-8	
	10	2	0	0	0	16	22	12	0	0	70	0	0	0	0	
	11	2	0	0	0	4	16	6	0	0	42	0	0	0	0	
	12	2	0	0	0	0	0	14	0	0	0	0	0	0	0	
	13	2	0	0	0	0	0	16	0	0	0	12-0	1-10	0-7	8-8½	
	14	2	0	0	0	0	0	15	0	0	0	4-0	1-6	0-7	4-13	
	15	1	0	0	0	0	0	13	0	0	0	12-10	2-4	0-5	8-14	
		19	0	0	0	136	187	168	0	75	248	0	0	0	69-9½	
	16	2	0	0	0	0	0	15	0	0	0	4-0	2-0	0-5	5-0	
	17	2	0	0	0	0	0	15	0	0	0	0-0	0-0	0-0	0-0	
	18	2	0	0	0	0	0	10	0	0	0	12-10	2-4	0-6	10-10	
	19	1	0	0	0	0	0	8	0	0	0	4-0	2-0	0-6	6-0	
	20	0	0	0	0	0	0	7	0	0	0	12-6	2-0	0-7	10-13	
	21	0½	0	0	0	0	0	7	0	0	0	4-0	1-12	0-7	6-2	
	22	3	0	0	0	1	1	9	0	0	6	12-2	1-12	0-6	7-15	
	23	3	0	0	0	1	0	8	0	0	4	4-0	1-8	0-6	4-8	
	24	3	0	0	0	0	0	7	0	0	0	11-14	1-8	0-8	8-14	
	25	3	0	0	0	0	0	7	0	0	0	4-0	1-4	0-8	5-0	
	26	2	0	0	0	0	0	7	0	0	0	0-0	0-0	0-0	0-0	
	27	1	0	0	0	0	0	8	0	0	0	11-14	1-8	0-6	6-8	
	28	2	0	0	0	0	0	8	0	0	0	4-0	1-4	0-6	3-12	
	29	2	0	0	0	0	0	11	0	0	0	0-0	0-0	0-0	0-0	
	30	2	0	0	0	0	0	10	0	0	0	0-0	0-0	0-0	0-0	
		28½	0	0	0	2	1	137	0	0	10	0	0	0	75-2	

APPENDIX I, 3. (Continued.)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1852															
July,															
1	1	0	0	0	0	0	7	7	0	0	0	11-4	1-4	0-8	7-8
2	2	0	0	0	0	0	6	8	0	0	0	0	0	0	0
3	2	0	0	0	0	0	6	8	0	0	0	0	0	0	0
4	0	0	0	0	0	0	5	0	0	0	0	4-0	1-0	0-8	4-0
5	2	0	0	0	0	0	6	8	0	0	0	0	0	0	0
6	2	0	0	0	0	0	6	9	0	0	0	0	0	0	0
7	2	0	0	0	0	3	2	6	9	0	18	0	0	0	0
8	2	0	0	0	0	0	0	5	10	0	0	0	0	0	0
9	2	0	0	0	0	0	0	9	9	0	0	0	0	0	0
10	2	0	0	0	0	0	0	5	9	0	0	0	0	0	0
11	1	0	0	0	4	2	5	21	12400	0	26	4-0	1-0	0-8	4-0
12	0	0	0	0	5	3	5	0	0	0	34	0	0	0	0
13	2	0	0	0	0	0	6	9	0	35	0	0	0	0	0
14	2	0	0	0	0	0	6	9	0	0	0	0	0	0	0
15	22	0	0	0	12	7	79	116	12400	35	78	0	0	0	15-8
16	2	0	0	0	0	0	6	9	0	0	0	11-4	1-4	0-8	7-8
17	3	0	0	0	0	3	0	2	0	0	22	11-4	1-4	0-8	7-8
18	3	0	0	0	1	1	2	3	0	0	6	0	0	0	0
19	3	0	0	0	2	1	3	8	0	0	12	0	0	0	0
20	3	0	0	0	0	0	0	0	0	0	4	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26	3	0	0	0	1	0	0	4	0	0	4	4-0	1-0	0-8	4-0
27	2	0	0	0	2	0	0	4	0	0	10	0	0	0	0
28	2	0	0	0	2	2	0	4	0	0	15	11-4	1-4	0-8	7-8
29	2	0	0	0	0	0	1	5	0	0	0	0	0	0	0
30	3	0	0	0	0	0	1	6	0	0	0	4-0	1-0	0-8	4-0
31	3	0	0	0	0	0	1	6	0	0	0	0	0	0	0
August															
1	31	0	0	0	11	7	20	60	0	0	73	0	0	0	30-8
2	2	0	0	0	0	0	1	6	0	0	0	4-4	1-0	0-4	2-2
3	2	0	0	0	4	0	1	6	0	0	16	4-4	1-0	0-4	2-2
4	1	0	0	0	5	5	2	6	0	0	37	4-2	0-15	0-28	3-14
5	5	0	0	0	2	2	2	6	5000	32	6	4-2	0-14	0-8	3-0
6	5	1	0	0	0	0	4	12	0	0	0	4-2	0-15	0-8	3-14
7	6	1	0	0	0	0	6	12	0	0	0	4-2	0-14	0-8	3-0
8	6	0	0	0	0	0	5	11	0	0	0	0	0	0	0
9	6	0	0	0	0	0	8	18	0	0	0	4-0	0-12	0-6	2-4
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	6	0	0	0	0	0	4	8	0	0	0	4-0	0-10	0-6	1-14
12	7	0	0	0	1	1	5	14	0	0	7	4-0	0-12	0-6	2-4
13	6	0	0	0	0	0	3	14	0	0	0	4-0	0-10	0-6	1-14
14	6	0	0	0	0	0	3	15	0	0	0	11-4	1-4	0-5	8-12
15	5	0	0	0	0	0	0	6	0	0	0	11-4	1-0	0-7	8-15
16	64	11	0	0	12	8	49	155	5000	32	66	0	0	0	44-0

APPEN

Form of the Abstract for Bridge Work, abstracted

Month and date.	Bricklayers.										Carpen- ters. at 4 an- nas.	Labourers at 2 annas.																		
	At 5½ annas.		At 5 ann.		At 4½ anns		At 4 annas.		At 3 annas.																					
	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.	No.	Amount.																				
	1	2	3	4	5	6	7	8	9	10				11	12	13	14	15												
1862				R. A. P.			R. A. P.				R. A. P.				R. A. P.															
May	15	3	1	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
June	20	15	5	2	6	25	7	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	26	3	1	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
July	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aug	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	20	22	7	11	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sept.	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct.	20	0	0	0	0	30	9	6	15	4	3	6	20	5	0	15	2	13	0	0	0	0	0	0	0	0	0	0	0	0
		43	14	15	3	55	17	3	15	4	3	6	183	45	14	121	22	12	6	14	3	8	966	120	13					

Particulars of the Charges for Sundries exceeding 5 Rs. each (to be given on the back of the Abstract.)

1852 August 6th. Value of 22 bamboo mats.....Rs. 8-0-0
 Cost of erecting a shed....." 12-0-0
20-0-0

DIX I, 4.

from the Cash Book in Appendix H. 7.

Women at 1½ annas.		Bricks at Rs. 1-12 per 1000		Chunam at 18 paras per pagoda		Rough stone work.				Sundries.				Total.
						At 7 annas.		At 6 annas.		Repair of iron tools and im- plements.	Items as per particulars be- low given.	Small items under 5 Rs ea.		
No.	Amount.	No.	Amount.	Paras.	Amount.	Cubic yards.	Amount.	Cubic yards.	Amount.					
16	17	18	19	20	21	22	23	24	25	26	27	28	29	
R. A. P.		R. A. P.		R. A.		R. A. P.		R. A. P.		R. A.	R.	R. A.	R. A. P.	
196	15 5 7	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	206-14 90	8 1 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	129 10 2	
216	16 14 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	59 13 6	
200	15 10 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	4 9 34	4 6	
0	0 0 0 0	35050 01	5 4 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	2 7 101	4 4 0	
0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	17 8 0	0 0 0 0	0 0 0 0	34 0 0	
0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 91-6 34	4 4 3	0 0 0 0	20 0 0	1 8 60	12 4 0		
250	19 8 6	0 0 0 0	0 0 0 0	2672 52	1 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	11 0 0	
125	9 12 3	17523 30	10 8 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 14 69	2 11 0	
20	1 9 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	0 0 0 0	1 4 26	11 6	
10073	73 11 4	2575 32	0 0 0 0	2672 52	1 0 0 0	206-14 90	8 1 0	191-6 34	4 4 4	20 8 20	10 1627	7 0 0		

Account of advances made for the Bridge Work and their adjustment (to be written on the back of the Abstract.)

Month and date.	Nature of advance.	Amount of advance.	Amount adjusted.	Date of adjustment in the Cash Book.	Remarks.
1852 May 1	Brought forward from the previous half year on account of the following advance.....				
	Advanced to Veerasawmy for supplying bricks at Rs. 1-12 per 1000.....	30	0	0	July 5
July 10	Advanced to Rungasawmy for supplying chunam at 18 paras per pagoda.....	30	0	0	August 20
" 15	Do. to Ramasawmy for constructing rough stones.....	30	0	0	August 6
" 26	Do. to Rungasawmy for supplying chunam at 18 paras per pagoda.....	6	0	0	
Aug. 8	Do. to Ramen for supplying bricks at Rs. 1-12 per 1000 ..	10	0	0	Sept. 29
					Outstanding against the contractor (to be taken to the next half years account.)

APPENDIX J. 1.

Form for the Report of workmen employed at a work under the Superintending Engineer Presidency Division; proposed temporarily in lieu of the present forms. See Para 297 of the Report.

(NEW WORK)

REPORT OF WORKMEN EMPLOYED UNDER THE CONICOPOLY VERASAWMY AT THE POWDER MAGAZINE IN REMOVING THE SLOPING ROOF AND CONSTRUCTING AN ARCHED ROOF IN ITS STEAD.

[illegible]

Description of Workmen.	Rates.	December 1850.																														Total No.	Total Amount.		
		5	6	7	9	10	11	12	13	14	17	18	19	20	21	23	24	25	26	27	28	30	31	Rs.	A.	P.									
Masonry.....	R.A.P.	0	9	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	1	2	6							
Bricklayers...	0	7	6	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	20	9	6	0							
Do.	0	6	3	6	8	8	4	3	4	5	2	3	3	0	2	1	4	14	7	11	11	4	4	6	118	46	1	6							
Do.	0	5	6	8	9	10	10	5	3	6	6	3	4	4	0	2	1	5	16	9	12	12	5	6	9	145	49	13	6						
Do.	0	5	0	4	4	3	3	3	2	4	3	2	2	0	1	2	3	9	5	8	9	3	4	4	80	25	0	0							
Men Coolies..	0	3	0	6	8	12	15	12	11	13	5	8	11	5	3	11	14	19	14	16	16	15	7	6	243	45	9	0							
Boys.....	0	1	10	25	38	42	58	33	51	55	30	23	26	30	9	10	17	45	50	33	32	34	17	15	14	685	-78	7	10						
Carpenters....	0	6	9	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	10	4	3	6							
Grinders.....	0	2	2	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	8	8	8	5	5	5	45	6	1	6							
																									265	13	4								

Description of Workmen.	Rates.	January 1851.																	Total No.	Total Amount.		
																				Rs.	A.	P.
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17				
Bricklayers..	0 7 6	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	4	1	14	0	
Do.	0 6 3	4	4	3	3	0	0	0	0	0	1	1	0	0	0	0	0	16	6	4	0	
Do.	0 5 6	6	7	4	2	0	0	0	0	0	1	0	0	0	0	0	0	20	6	14	0	
Do.	0 5 0	2	4	3	2	0	0	0	0	0	0	0	0	0	0	0	0	11	3	7	0	
Men Coolies...	0 3 0	6	6	5	4	1	1	0	0	0	0	0	0	0	0	0	0	23	4	5	0	
Boys.....	0 1 10	12	17	9	8	2	5	2	1	3	1	1	1	1	0	0	0	62	7	1	8	
Grinders.....	0 2 2	3	4	5	4	0	0	0	0	0	0	0	0	0	0	0	0	16	2	2	8	
Carpenters...	0 0 3	1	0	1	0	0	0	0	0	1	1	0	0	0	1	0	0	6	2	8	6	
																		34	8	10		

(Signed) A. B.
Asst. Overseer.

APPENDIX J, 2.

Form for Report of Materials Supplied for a Building under the Superintending Engineer Presidency Division. See Para 297 of the Report.

REPORT OF MATERIALS SUPPLIED BY THE GENERAL SUPPLIER HAKKEN ALLY SAIB, FOR CONSTRUCTING AN ARCHED ROOF TO A POWDER MAGAZINE.

APPENDIX J, 2.

Description of Materials.	Rate per.	November 1850.												Total Quantity.	Amount.	
		Rs. A P.													Rs.	A P.
		13	14	15	16	18	19	20	21	22	23	25	26	29		
Chunnam.....	Paras.....	61	62	62	62	162								61	525	91 14
River Sand.....	Carts.....	12	16	49	49	40	41	40	38	38	22	22	12	22	350	65 10
Palasios.....	Viss.....	6	6												6	7
Blaze Iron.....	No.....	1410	8,600												6	9
Well Bricks 1st sort.....	No.....	1410	8,600	2,000	5,000	5,000	4,600	4,600	200	200				20,400	50 10	
Do. 2d do.....	No.....		8,600	2,000	5,000	5,000	4,600	4,600	200	200				20,400	50 10	
Twine.....	Pollams.....	6	6												6	1
Pots.....	No.....	5	15	10										3	25	10 5
Do. Small.....	No.....	2		3											3	10 5
Chatties.....	No.....	2	10	20											30	30
Scaffolding Ropes.....	No.....	1	109	200	200	200									30	30
Arch Bricks.....	No.....	3	200	1,000	1,000										80	8
Cart hire.....	Different	3	3	3	3									200	3,800	14
Jaggery.....	Vis.....	16	8	8	8	20	50	12	1,200	500	800			15	255	70 11
Bricks 3d sort.....	No.....	3	8	0	15				60	6	4	4		4	10	4
Bamboos.....	No.....	0	1	2					1,500						4,000	6 5 10
Palmarah Trees.....	No.....	1	2	0									15	2,400	15	1 1 6
Cart hire for do.....	No.....	0	6	0									10		10	11 4
Nails.....	Vis.....	0	3	4									10		10	3 12
Mango Planks.....	Feet.....	3	8	0	40									1	50	1 6
														50	385	3 1

APPENDIX J, 2. (Continued.)

69

Description of Materials.	Rate per.	December 1850.																Total Quantity.	Amount.								
		Rs. A. P.																	Rs.	A. P.							
		5	6	7	9	10	11	12	13	14	16	17	18	21	23	24	25	26	27	28	30	31					
Wall Bricks 1st sort..	No.	1,600		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,600		12	14	6	
Do. do. 2d do...	No.	1,600		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,600					
Arch Bricks.....	No.	1,600		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,200		11	12	8	
Chunnam.....	Par.	20 P.	30	0	60	59	61	91	30	29	30	30	28	30	0	61	29	32	0	31	58	31	720		126	0	0
Chatties and Poles	No.	Different.	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56		0	9	7	
Jaggery	Vis.	16 S.	0	6	16	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46		4	11	11	
Ladies.....	No.	0 14	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20		0	2	10	
Grinding Stones & Rollers	No.	0 13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4		1	10	0	0
Bamboo Mats.....	No.	0 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50		8	9	6	
Brick Jelly.....	Cart	3 S.	0	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62		7	3	9	
Earthen Tubs	No.	0 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3		0	14	3	
Do. Pipes.....	No.	0 0 3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9,272		169	0	4	
Well Bricks.....	No.	3 S.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5,100		16	3	8	
Palmarah Trees 18 ft. long	No.	1 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2		2	4	0	
Cart hire for do.....	No.	0 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2		2	4	0	
Gingely Oil.....	Mea.	0 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1		0	5	0	
Nails.....	Vis	0 3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1		0	5	2	
Flat Tiles.....	No.	3 S.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23,600		36	14	11	
Scaffolding Ropes.....	No.	1 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	210		2	1	7	
Bahapom.....	Vis.	0 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8		0	8	0	
White Cloth	Cubs	2 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	72		4	8	0	
River Sand.....	Cart	0 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	196		36	12	6	
Cart hire.....	No.	different.	30	9	34	0	27	12	0	0	24	12	0	10	4	0	2	0	0	0	0	186		49	9	10	
White Sand.....	Cart	0 10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2		1	4	0	
																						495		1	6		

January 1851.															
Rs. A. P.															
1	2	3	15												
Square Bricks 8 inches...	No.	350	1,100	880	220	0									
Cart hire.....	No.	Different.	16	8	22	0									
White Cloth.....	Cb.	2 4	0	23	0	0									
Brass hinges.....	No.	0 4	3	0	0	8									
Fastening Hooks.....	No.	0 2	0	0	0	4									
Copper Nails.....	No.	0 6	0	0	0	0	0	0	0	0	0	0	0	0	0

January 1851.

|--|

162

APPENDIX J, 5.
Form for Abstract of the Workpeople Employed on account of a Building. See Para 297 of the Report.
ABSTRACT OF WORKPEOPLE EMPLOYED IN THE POWDER MAGAZINE IN REMOVING THE SLOPING ROOF AND CONSTRUCTING AN ARCHED ROOF IN ITS STEAD (ABSTRACTED FROM APPENDICES J, 1 AND J, 3.)

Description of Workmen.	Rate.	For November 1850.			For December 1850.			For January 1851.			Total.	
		Employed in the Work Spot.		No.	Employed in the Carpen-ter's Yard.		No.	Employed in the Work Spot.		No.	Amount.	No.
		Amount.	No.		Amount.	No.		Amount.	No.			
Maistry.....	R. A. P.	1 2 6	2	0	1 0 9 3	0	0	0 0 0	0	0	2 14 3	5
Concapholy.....	0 9 3	0 0 0	0	0	0 0 0	0	0	0 0 0	0	0	1 12 0	4
Do.....	0 5 6	0 0 0	0	0	0 0 0	0	0	0 0 0	0	0	2 1 0	6
Bricklayers.....	0 7 6	2 5 6	5	0	0 0 0	0	0	1 14 0	0	0	13 9 6	29
Do.....	0 6 3	18 5 9	47	0	46 1 6	16	0	6 4 0	0	0	181 70 11	183
Do.....	0 5 6	19 15 0	53	0	49 13 6	20	0	6 14 0	0	0	223 76 10	233
Do.....	0 5 0	5 0 0	30	0	25 0 0	11	0	3 7 0	0	0	121 37 13	132
Men coolies.....	0 3 6	36 15 0	197	0	45 9 6	243	0	4 5 0	0	0	86 13 0	463
Boys.....	0 1 10	54 3 0	474	0	78 7 10	62	0	7 11 8	0	0	139 14 6	142
Grinders.....	0 2 2	0 0 0	0	0	0 0 0	0	0	2 2 5	0	0	8 4 2	61
Do for paint.....	0 3 0	0 0 0	0	0	0 0 0	0	0	0 0 0	0	0	1 0 3	1
Carpenters.....	0 6 9	3 12 9	9	0	4 3 10	6	0	2 8 5	0	0	11 13 0	28
Do.....	0 6 3	0 12 6	3	0	0 0 0	0	0	0 0 0	0	0	2 5 6	6
Sawyers.....	0 5 0	0 0 0	0	0	0 0 0	0	0	0 0 0	0	0	1 15 3	5
Do.....	0 5 0	0 0 0	0	0	0 0 0	0	0	0 0 0	0	0	0 10 0	2
Smiths.....	0 9 0	0 0 0	0	0	0 0 0	0	0	0 0 0	0	0	2 4 0	4
Do.....	0 7 6	0 0 0	0	0	0 0 0	0	0	0 0 0	0	0	1 0 8 6	1
Do.....	0 6 9	0 0 0	0	0	0 0 0	0	0	0 0 0	0	0	4 10 3	9
Do.....	0 6 3	0 0 0	0	0	0 0 0	0	0	0 0 0	0	0	0 12 6	2
Hammermen.....	0 3 0	0 0 0	0	0	0 0 0	0	0	0 0 0	0	0	2 4 0	12
Belows boys.....	0 1 10	0 0 0	0	0	0 0 0	0	0	0 0 0	0	0	2 12 0	24
Painters.....	0 6 3	0 0 0	0	0	0 0 0	0	0	0 0 0	0	0	0 6 3	1
		148 2 9	8 4 2		265 13 4	17 12 7		34 8 10	0 9 3		475 2 11	

APPENDIX J, 5.

APPENDIX J, 6.

Form for Abstract of the Materials Supplied on account of a Building.
ABSTRACT OF MATERIALS SUPPLIED FOR CONSTRUCTING AN ARCHED ROOF IN THE POWDER MAGAZINE.—(ABSTRACTED FROM APPENDICES J, 2 AND J, 4.)

Description of Materials.	Rate.	For November 1850.			For December 1850.			For January 1851.			Total.					
		On the Work Spot.		In the Carpenter's Yard.	On the Work Spot.		In the Carpenter's Yard.	On the Work In the Carpenter's Yard.		Total.	Quantity.					
		Amount.	Quantity.		Amount.	Quantity.		Amount.	Quantity.							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Chunam.....	Rs. A. P.	3 8	0 20 Par.	525	91 14 0	0	0	720	126 0 0	0	0	0	0	0	1245	217 14 0
River Sand.....	0 3	0 3	0 each.	350	65 10 0	0	0	196	36 12 0	0	0	0	0	0	546	102 6 0
Plastics.....	0 1	0 1	2 Viss	6	0 7 0	0	0	0	0 0 0	0	0	0	0	0	6	0 7 0
Rings Iron.....	0 1	0 1	6 each	6	0 9 0	0	0	0	0 0 0	0	0	0	0	0	6	0 9 0
Wall Bricks 1st sort.	0 8	0 8	20,400	50 10 3	0	0	2,600	6 7 3	0	0	0	0	0	0	23,000	11 2 11
Do. 2d do.	0 8	0 8	20,400	50 10 2	0	0	2,600	6 7 3	0	0	0	0	0	0	23,000	11 2 11
Do. 3d do.	0 8	0 8	4,000	6 5 10	0	0	0	0 0 0	0	0	0	0	0	0	4,000	6 5 10
Twine.....	0 8	0 8	6 Viss	6 1 3	0	0	0	0 0 0	0	0	0	0	0	0	6	0 1 3
Pots large.....	0 0	0 0	25 each	0 10 5	0	0	1	0 0 5	0	0	0	0	0	0	26	0 10 10
Do. small.....	0 0	0 0	3 do.	0 0 6	0	0	0	0 0 0	0	0	0	0	0	0	3	0 0 6
Chatties.....	0 0	0 0	30 do.	0 5 0	0	0	55	0 9 2	0	0	0	0	0	0	85	0 14 2
Scaffolding Ropes.....	1 0	1 0	100	8 0 0	0	0	210	2 1 7	0	0	0	0	0	0	1,010	10 1 7
Arch Bricks.....	3 8	3 8	3,800	14 0 0	0	0	3,200	11 12 8	0	0	0	0	0	0	7,000	25 12 8
Carts.....	Different.	16 8	265	70 11 9	0	0	183	49 9 10	46	12 11 0	0	0	0	0	497	133 6 7
Jaggery.....	0 1	0 1	0 Candy.	40 4 2 0	0	0	46	4 11 11	0	0	0	0	0	0	86	8 12 11
Bamboos.....	0 1	0 1	2 each	15 1 1 6	0	0	0	0 0 0	0	0	0	0	0	0	15	1 1 6
Palmarah Trees.....	0 2	0 2	0 do.	10 11 4 0	0	0	2	2 4 0	0	0	0	0	0	0	12	13 8 0
Cart hire for do.....	0 6	0 6	0 do.	10 3 12 0	0	0	2	0 12 0	0	0	0	0	0	0	12	4 8 0
Nails.....	0 3	0 3	4 lbs.	1 0 10 5	0	0	1	0 6 5	2	0	0	0	0	0	13	0 15 7
Mango Planks.....	0 14	0 14	50 40 feet.	50 4 6 0	0	0	6	0 0 0	0	0	0	0	0	0	56	4 6 0
Ladles.....	0 13	0 13	100	0 0 0	0	0	20	0 2 10	0	0	0	0	0	0	20	0 2 10
Rollers and grinding Stones.....	0 13	0 13	0 Set.	0 0 0	0	0	4	1 10 0	0	0	0	0	0	0	4	1 10 0
Bamboo Mats.....	0 2	0 2	9 each	0 0 0	0	0	50	8 9 6	0	0	0	0	0	0	50	8 9 6

APPENDIX J, 6.

73

164

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Brick, Jelly	Cart	Rs. A. P.	30 Crt.		Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Do. Pipes	No.	0 4 9	each		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Do. Pipes	"	0 0 0	do		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Well, 2000	"	0 0 0	do		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Gingely Oil	Meas.	0 0 0	1100		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Flat Tiles	No.	0 0 0	2710		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Belapour	Vis.	0 0 0	36 Cub.		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
White Clay	Cub.	0 0 0	350		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Square Bricks	No.	0 0 0	each		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Brass Hinges	"	0 0 0	do		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Fastening Hooks	"	0 0 0	100		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Copper Nails	C. ft.	0 0 0	4 C. ft.		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Timber Teak	lbs.	0 0 0	Vis.		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Brass	do.	0 0 0	do.		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Zinc	do.	0 0 0	do.		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Coarse Cloth	Cub.	0 0 0	24 Cub.		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Hoops Iron	lbs.	0 0 0	Candy		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Bolts Iron	"	0 0 0	do		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Steel	"	0 0 0	Vis.		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Braties	No.	0 0 0	400		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Lamp Oil	Vis.	0 0 0	Vis.		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Half Roundfile	No.	0 0 0	each		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Charcoal	Parah	0 0 0	each		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Large Crucibles	each	0 0 0	each		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Linsed Oil	Vis.	0 0 0	Gallon		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Chalk	"	0 0 0	Vis.		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Red Ochre	do.	0 0 0	do.		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
White Sand	each	0 0 0	do.		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Padlock Brass double	No.	0 0 0	do.		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Bolts Copper	lbs.	0 0 0	7 11 1/2 lbs.		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Sheet Brass	"	0 0 0	Vis.		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0
Paddy Husk	S.	0 0 0	Scoop		0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0	0 0 0

APPENDIX J 7.

Form for the bill prepared from the Abstracts in Appendices J 5 and J 6. See para 297 of the Report.
(MILITARY DEPARTMENT.) (NEW WORK.)

PUBLIC BUILDINGS.

BILL No. 66 OF 1850-51.

PRESIDENCY DIVISION.

WORK.—Constructing an arched roof with pot cylinders and arch bricks to a Magazine at the Gunpowder Manufactory.

Description of Charges.	Amount.		Total.	
	Rs.	A. P.	Rs.	A. P.
<i>Labour.</i>				
29 Bricklayers.....at..Rs..0-7-6 each....	13	9 6		
181 do.....at.....0-6-3 do....	70	11 3		
223 do.....at.....0-5-6 do....	76	10 6		
121 do.....at.....0-5-0 do....	37	13 0		
463 Men coolies.....at.....0-3-0 do....	86	13 0		
1221 Boys.....at.....0-1-10 do....	139	14 6		
61 Women.....at.....0-2-2 do....	8	4 2		
28 Carpenters.....at.....0-8-9 do....	11	13 2		
6 do.....at.....0-6-3 do....	2	5 6		
5 Sawyers.....at.....0-8-3 do....	1	15 3		
2 do.....at.....0-5-0 do....	0	10 0		
4 Smiths.....at.....0-9-0 do....	2	4 0		
1 do.....at.....0-7-6 do....	0	8 6		
9 do.....at.....0-6-9 do....	4	3 6		
11 do.....at.....0-6-3 do....	4	10 3		
2 do.....at.....0-6-3 do....	0	12 6		
12 Hammermen.....at.....0-3-0 do....	2	4 0		
24 Bellows boys.....at.....0-1-10 do....	2	12 0		
1 Painter.....	0	6 3		
1 Paint grinder.....	0	3 0		
4 Conicopolies.....at.....0-7-0 do....	1	12 0		
6 do.....at.....0-5-6 do....	2	1 0		
5 Maistries.....at.....0-9-3 do....	2	14 3		
			475	2 11
<i>Materials.</i>				
No.				
23,000 Wall bricks 1st sort } at..Rs..3-8-0 for.. 1,410 No.	114	2 11		
23,000 do 2d do } .. 3-8-0 .. 2,200 "	6	5 10		
4,000 do 3d do.....at.....3-8-0 .. 2,200 "	36	14 11		
28,600 Thick flat tiles.....at.....16-8-0 .. 2,710 "	8	13 11		
86 Viss Jaggery.....at.....3-8-0 .. 950 No.	25	12 8		
7,000 Arch bricks.....at.....0-2-9 .. each.	8	9 6		
50 Bamboo mats.....at.....3-8-0 .. 1,100 No.	16	3 8		
5,100 Well Bricks 8 feet.....at.....3-8-0 .. 4 C. ft.	7	9 7		
844 Cubic feet Timber teak.....at.....3-8-0 .. 350 No.	22	0 0		
2,200 Square Bricks.....at.....4-3-2 } .. each	6	4 9		
2 Padlocks brass double.....at.....2-1-7 }				
3,272 Earthen pipes.....at.....0-0-3 }	169	0 4		
95 Cubits white cloth.....at.....2-4-0 .. 36 Cubits.	5	15 0		
444 Cart hire for bricks &c.....at.....0-4-3 .. Cart.	118	1 1		
62 Carts brick jelly.....at.....3-8-0 .. 30 do	7	3 9		
1,245 Parahs of chunnam.....at.....3-8-0 .. 20 Ph.	217	14 0		
552 Cans river sand.....at.....0-3-0 .. Cart.	103	8 0		
1,010 Sack of lime.....at.....1-0-0 .. "	10	1 7		
47 Cart hire for store things.....at.....0-4-6 .. do	13	3 6		
12 Pambira trees 18 ft lg.....at.....1-2-0 .. each.	13	8 0		
75 lbs. 32 gans brass.....at.....1-10-0 .. viss.	40	4 9		
Sundry items, below 5 Rupees.....	34	2 10		
			985	12 7
Total Company's Rupees.....			1,460	15 6

Fort St. George, }
2d March, 1851. }

(Signed,) A. B.
Executive Engineer.

(Signed) J. E. HOPKINS.
Assistant Overseer.

APPENDIX L.

[illegible]

APPENDIX M.

Rules for estimating periodically, the value of Buildings, the property of the Honorable Company, under this Presidency, submitted by the Military Board, and sanctioned by Government in Minutes of Consultation, 7th October, 1839.

Observations.

1.—Common repairs, the object of which is to prevent buildings from going to ruin, and keep them in a serviceable state, should not be considered as adding to the original value, but merely as preventing that value from decreasing more rapidly, than is fairly attributed to age and use, while the buildings are not neglected—such repairs therefore, ought not to enter into the account. But extensive repairs or improvements, such as the renewal of the roofs and floors, and doors or windows, though they do not increase the original value of buildings, often restore them wholly or nearly to that value, and therefore must be allowed for, in calculating the present valuation estimate.

2.—In regard to the progressive deterioration of buildings, it is impossible to establish fixed rules which can be strictly followed in all cases, without being led into great error. The materials, station, mode of construction, age, situation, and the purposes to which the building is applied, must all enter into the calculation, and in very few cases, will all these elements be found to correspond. A building on the sea coast, in a marshy soil, and in an exposed situation will last a much shorter period, than one of the same original value and quality, in an inland and sheltered position. Again, the ravages of storms and hurricanes often prove more injurious in a few hours, than the ordinary effects of the seasons for years. From these causes, it is evident, that whatever rules are adopted, the value of buildings must be periodically revised and corrected, or great errors and confusion must be the result.

3.—If however, the buildings be divided into classes, rules may be established, by means of which, with periodical revision, say once every ten years, the value may be calculated and determined with sufficient accuracy for the purpose required.—With this view, the Board will respectfully submit the following for the consideration and approval of his Lordship in Council.

Rules.

1.—Ordinary repairs not to enter into the calculation, but to be considered as preserving the buildings in a serviceable state.

2.—The cost of additions and improvements to be added to the estimated value of the building, either wholly or in part, according to the ratio in which they increase the actual value. It is to be observed, that the additions and improvements, generally add to the value of buildings, they seldom do so in a degree equal to their cost.

3.—The fortifications of Fort St. George and Black Town, so long as they are kept in complete repair as at present, deteriorate very slowly, in respect to them, therefore, and generally to all Bomb proof Powder Magazines, and generally to all arched buildings when of stone or brick in chunam, and are free from defects, as long as they are kept in thorough repair, the value may remain on the books at their present estimated amount, to be revised and corrected for an inspection of the works and buildings every tenth year, instead of being reduced annually, according to any fixed scale. The timber work and perishable parts are supposed to be repaired and renewed as required.

4.—The value of brick in chunam terraced buildings, to be reduced at the rate of one per cent annually, on the renewal of the roofs, floors or fixtures of these buildings, which are the parts that chiefly decay, and addition to the calculated value will be made in proportion to the cost of the improvements.

5.—The value of brick in clay terraced buildings, to be reduced at the rate of two per cent.

6.—The value of brick in chunam buildings with tiled roofs, to be reduced at the rate of two and a half per cent.

7.—The value of brick in clay buildings, with tiled roofs, at the rate of four per cent.

8.—The temporary buildings, no fixed rule can be established, as the rate of their progressive deterioration must be regulated by the character of the materials of which they are built, and the uses to which they are appropriated; and the scale must be fixed, with reference to these circumstances, on the construction of such buildings.

9.—The Dead stock account of all the buildings at the Presidency and of Military and Ecclesiastical buildings in the Provinces, will be kept in the Office of the Military Board, and classed under the heads in the margin.

10.—The Dead stock account of all Revenue, Civil, and Public buildings in the Provinces, will be kept in the Revenue Board Office, in the Department of Public Works.

General Military Rules.

APPENDIX N.

Dead Stock account extracted from the Military Board Books.

Stations.	Military Buildings.	Civil Buildings.	Total.		Total.
			Military Buildings.	Civil Buildings.	
1	2	3	4	5	6
	Rs.	Rs.	Rs.	Rs.	Rs.
<i>Northern Division.</i>					
Berhampore.....	6,096	0			
Chicaole.....	0	0			
Condapilly.....	0	0			
Ellore.....	19,054	0			
Guntoor.....	0	0			
Ganjam.....	8,280	0			
Masulipatam.....	3,06,900	0			
Rajahmundry.....	0	0			
Russelcondah.....	6,068	0			
Samulcottah.....	0	0			
Vizagapatam.....	35,035	0			
Vizianagarum.....	0	0			
Waltair.....	6,911	0			
			3,88,344	0	3,88,344
<i>Hyderabad Subsidiary Force.</i>					
Jaulnah.....	2,32,817	0			
Secunderabad.....	8,18,637	0			
			10,51,454	0	10,51,454
<i>Ceded Districts.</i>					
Bellary.....	4,74,077	0			
Cuddapah.....	8,970	0			
Cumbam.....	1,346	0			
Gooty.....	68,640	0			
Kurnool.....	8,883	0			
			5,61,916	0	5,61,916
<i>Malabar and Canara.</i>					
Cannanore.....	3,49,111	0			
Calicut.....	2,550	0			
Honore.....	1,203	0			
Mallapoorum.....	988	0			
Mangalore.....	23,794	0			
Manantoddy.....	20,757	0			
Pootoor.....	7,592	0			
Sedashghur.....	3,679	0			
Sirey.....	2,856	0			
Tellicherry.....	1,200	0			
			4,13,730	0	4,13,730
<i>Presidency Division.</i>					
Black Town and its environs.....	5,63,268	0,71,135			
Fort Saint George.....	14,13,236	23,41,219			
St. Thomas Mount.....	8,57,520	0			
Poonamallee Cantonment.....	82,758	0			
* Do. Fort.....	35,945	0			
Palaveram.....	2,48,283	0			
			27,01,020	24,12,354	51,13,384
Carried forward.....			51,16,474	24,12,354	75,28,828

1.	2	3	4	5	6
	Rs.	Rs.	Rs.	Rs.	Rs.
Brought forward.....			51,16,474	24,12,354	75,28,828
<i>Centre Division.</i>					
Arcoot.....	5,022	0			
Arnee.....	43,987	0			
Chingleput.....	373	0			
Chittoor.....	1,626	0			
Nellore.....	1,580	0			
Ongole.....	660	0			
Trippasore.....	0	0			
Vellore.....	70,705	0			
Wallajahbad.....	17,903	0			
			1,41,856	0	1,41,856
<i>Southern Division.</i>					
Combaconum.....	740	0			
Cochin.....	8,058	0			
Coimbatore.....	0	0			
Dindigul.....	1,65,556	0			
Madura.....	1,600	0			
Negapatam.....	4,197	0			
Neelgherry.....	0	0			
Palamcottah.....	31,511	0			
Paulghant Cherry.....	0	0			
Quilon.....	44,824	0			
Tranquebar.....	7,800	0			
Trichinopoly.....	3,80,965	0			
			6,45,251	0	6,45,251
<i>Mysore Division.</i>					
Bangalore.....	6,94,556	0			
French Rocks.....	38,358	0			
Hurryhur.....	30,763	0			
Royacottah.....	3,405	0			
			7,67,082	0	7,67,082
<i>Saugor Division.</i>	7,06,896	8,40,542			
			7,06,896	8,40,542	15,47,438
<i>Nagpore Subsidiary Force</i>					
Kamptee.....	1,54,669	0	1,54,669	0	1,54,669
Grand Total.....			75,32,228	32,52,896	107,85,124

Form for the Journal showing the transactions on account of the Public Works to be prepared in the Department of Public Works for submission to the Accountant General.

FORT ST. GEORGE, 1st MAY 1853.

JOURNAL LETTER B OF THE MADRAS PUBLIC WORKS DEPARTMENT
UNDER THE PRESIDENCY OF FORT ST. GEORGE FOR THE
OFFICIAL YEAR 1853-54 OR FROM 1st MAY, 1853
TO 30th APRIL 1854.

0	Sundry Accounts Dr. to Balance.				
1	Company's Rupees 76,28,339-9-2				
	For amount of dead stock money and balance outstanding against the following heads on account of the Public Works of the Madras Presidency brought from the last Book A.				
2	Dead Stock.....	75,11,210-6-0			
	Balance against the following Officers.				
1	Executive Engineer at the Presidency Division.....	36,124-3-6			
1	District Engineer of North Arcot.....	14,131-11-0			
1	District Engineer of Chingleput.....	11,695-11-0			
1	District Engineer of Rajahmundry.....	39,185-13-2			
1	District Engineer of Coimbatore.....	15,868-15-1			
		1,17,129-3-3			
		76,28,339	9	3	
1	Balance Dr. to General Books.				
	Company's Rupees 76,28,339-9-2				
	For balance closed to the latter head in the closing entries of last year now re-credited to it.	76,28,339	9	3	
0	Sundry Accounts Dr. to Dead Stock.				
2	Company's Rupees 75,11,210-6-0				
	For amount of balance outstanding to the debit of the following heads on 30th April 1853 closed by transfer to the debit of the above head in the Books for 1852-53 now brought forward to exhibit the balance under it separately in the transactions of the current year.				
2	Irrigation Works.....	20,00,000-0-0			
2	Communications.....	13,00,000-0-0			
2	Civil Buildings.....	20,90,043-2-0			
2	Buildings Military.....	20,12,161-2-0			
2	Stores of Public Works Department.....	1,00,000-0-0			
		75,11,210	6	0	
	31st May 1853.				
2	Public Works Department Dr. to Sundry Accounts.				
0	Company's Rupees 9,29,942-14-8				
	For amount paid by the Revenue and Military Departments to the several Engineer Officers on account of Public Works.				
3	General Treasury at Fort St. George.....	2,05,486-4-0			
3	Collector of North Arcot.....	1,15,878-1-9			
3	Collector of Chingleput.....	1,25,623-2-9			
3	Collector of Rajahmundry.....	2,91,661-0-2			
3	Collector of Coimbatore.....	75,277-5-0			
3	Military Books.				
	Deputy Paymaster of Ponnalystan.....	46,000-0-0			
	Paymaster of Vellore.....	70,017-1-0			
		1,16,017-1-0			
		9,29,942	14	8	

0	Sundry Accounts Dr. to Public Works Department.			
2	Company's Rupees.. 9,29,942-14-8			
	For amount drawn by the undermentioned Engineer Officers from the Revenue and Military Departments on account of Public Works.			
1	Executive Engineer at the Presidency Division.....	2,05,486-4-0		
1	District Engineer of North Arcot.....	1,85,895-2-0		
1	District Engineer of Chingleput.....	1,71,693-2-9		
1	District Engineer of Rajahmundry.....	2,91,651-0-2		
1	District Engineer of Coimbatore.....	75,277-5-0		
		9,29,942	14	8
2	Public Works Department Dr. to Sundry Accounts.			
6	Company's Rupees.. 8,34,084-2-1			
	For amount of Bills on account of Public Works credited to the following heads.			
1	Executive Engineer at the Presidency Division.....	2,05,486-4-0		
1	District Engineer of North Arcot.....	1,85,895-2-0		
1	District Engineer of Chingleput.....	93,776-11-11		
1	District Engineer of Rajahmundry.....	2,97,181-12-0		
1	District Engineer of Coimbatore.....	65,585-2-10		
		8,34,084	2	1
0	Sundry Accounts Dr. to Public Works Department.			
2	Company's Rupees.. 8,34,084-2-1			
	For amount of Bills on account of Public Works debited to the following heads.			
2	Irrigation Works.			
	North Arcot.....	35,670-10-6		
	Rajahmundry.....	2,79,066-8-6		
		3,14,737-3-0		
4	Roads and Bridges.			
	North Arcot.....	46,512-0-0		
	Chingleput.....	35,601-3-0		
		82,113-3-0		
4	Rail Roads.			
	Presidency Division.....	58,960-6-0		
4	Ferry Boats.			
	North Arcot.....	1,609-2-0		
	Chingleput.....	356-0-0		
		1,965-2-0		
4	Canals.			
	Presidency Division.....	3,770-7-4		
	North Arcot.....	5,671-5-0		
		9,441-12-4		
4	Ports and Harbours.			
	Rajahmundry.....	1,260-5-0		
4	River Navigation.			
	North Arcot.....	3,600-0-0		
5	Buildings Revenue.			
	North Arcot.....	281-6-7		
	Carried forward.. 4,72,368-5-11			

	Sundry Accounts Dr. to Public Works Department.			
	Continued and brought forward.. 4,72,368-5-11			
5	Buildings Judicial.			
	Chingleput.....	150-0-0		
	Rajahmundry.....	552-6-6		
	Coimbatore.....	160-8-2		
		862-14-8		
5	Buildings General.			
	North Arcot.....	371-2-11		
	Chingleput.....	66-8-0		
	Coimbatore.....	2,671-2-7		
		3,108-13-6		
5	Buildings Ecclesiastical.			
	Chingleput.....	1,500-0-0		
	Coimbatore.....	2,008-12-5		
		3,508-12-5		
5	Buildings Marine.			
	Presidency Division.....	59,601-5-6		
2	Buildings Military.			
	Presidency Division.....	1,256-5-0		
	Coimbatore.....	20,425-13-5		
		21,682-2-5		
5	Repairs of Irrigation Works.			
	North Arcot.....	42,545-3-0		
	Chingleput.....	52,370-9-0		
	Rajahmundry.....	1,356-0-0		
		96,271-12-0		
5	Repairs of Roads and Bridges.			
	North Arcot.....	6,401-6-0		
	Chingleput.....	1,601-4-0		
	Rajahmundry.....	13,672-4-0		
	Coimbatore.....	3,692-4-0		
		25,367-2-0		
6	Repairs of Rail Roads.			
	Presidency Division.....	3,609-7-0		
6	Repairs of Ferry Boats.			
	Presidency Division.....	362-0-0		
	North Arcot.....	365-4-3		
		727-4-3		
6	Repairs of Canals.			
	Presidency Division.....	462-4-0		
	North Arcot.....	296-5-0		
		758-9-0		
6	Repairs of Ports and Harbours.			
	Coimbatore.....	379-6-0		
6	Repairs of River Navigation.			
	North Arcot.....	567-8-0		
5	Repairs of Revenue Buildings.			
	North Arcot.....	44-2-6		
	Chingleput.....	605-14-5		
	Coimbatore.....	997-1-7		
		1,647-2-6		
	Carried forward.. 6,90,469-9-2			

Madras Public Works Department 31st May 1853.

Sundry Accounts Dr. to Public Works Department.			
Continued and brought forward		6,90,460-	9-2
6 Repairs of Judicial Buildings.			
Chingleput.....	55-14-1		
Coimbatore.....	8,504-4-0		
		8,560-	6-1
7 Repairs of General Buildings.			
North Arcot.....	1,038-7-4		
Chingleput.....	1,161-9-5		
Coimbatore.....	13,370-14-0		
		15,570-	14-9
7 Repairs of Ecclesiastical Buildings.			
Chingleput.....	7-14-0		
Coimbatore.....	2,697-11-3		
		2,705-	9-3
7 Repairs of Marine Buildings.			
Presidency Division.....	295-6-0		
Rajahmundry.....	1,265-4-0		
		1,560-	10-0
7 Repairs of Military Buildings.			
Presidency Division.....	1,00,415-0-5		
North Arcot.....	1,265-0-0		
Coimbatore.....	10,110-10-5		
		1,11,790-	10-10
2 Stores of Public Works Department.			
Presidency Division.....	1,000-0-0		
Chingleput.....	200-0-0		
Coimbatore.....	300-0-0		
		1,500-	0-0
4 Miscellaneous charges on account of Public Works.			
Presidency Division.....	568-15-0		
North Arcot.....	1,000-0-0		
Chingleput.....	100-0-0		
Coimbatore.....	266-7-0		
		1,935-	0-0
		8,34,031-	2-1
*** The Journal entries should be continued in the same manner for the other eleven months; and the adjustment and closing entries be made at the end of the year as follows.			
30th April 1854.			
7 Charges General of the Revenue Department Dr. to Repairs of Irrigation Works.			
Company's Rupees 96,271-12 0			
For amount of charges under the latter transferred to the former head..		96,271-	12-0

Madras Public Works Department 30th April 1854.

2 Communications Dr. to Sundry Accounts.			
0 Company's Rupees 1,57,349-12-4			
For amount of charges under the following heads transferred to this head.			
4 Roads and Bridges.....	82,113-	3-0	
4 Rail Roads.....	58,960-	6-0	
4 Ferry Boats.....	1,965-	2-0	
4 Canals.....	9,441-	12-4	
4 Ports and Harbours.....	1,269-	5-0	
4 River Navigation.....	3,600-	0-0	
		1,57,349-	12-4
2 Civil Buildings Dr. to Sundry Accounts.			
0 Company's Rupees 67,363-4-8			
For amount of charges under the following heads transferred to this head.			
5 Buildings Revenue.....	281-	6-7	
5 Buildings Judicial.....	862-	14-8	
5 Buildings General.....	3,108-	13-6	
5 Buildings Ecclesiastical.....	3,508-	12-5	
5 Buildings Marine.....	59,601-	5-6	
		67,363-	4-8
8 Repairs of Communications Dr. to Sundry Accounts.			
0 Company's Rupees 31,409-4-3			
For amount of charges under the following heads transferred to this head.			
5 Repairs of Roads and Bridges.....	25,367-	2-0	
6 Repairs of Rail Roads.....	3,609-	7-0	
6 Repairs of Ferry Boats.....	727-	4-3	
6 Repairs of Canals.....	758-	9-0	
6 Repairs of Ports and Harbours.....	379-	6-0	
6 Repairs of River Navigation.....	567-	8-0	
		31,409-	4-3
7 Charges General of the General Department Dr. to Sundry Accounts.			
0 Company's Rupees 35,309-12-3			
For amount transferred to this head.			
4 Miscellaneous charges on account of Public Works.	1,935-	6-0	
8 Repairs of Communications.....	31,409-	4-3	
2 Communications			
Ferry Boats.....	1,965-	2-0	
		35,309-	12-3
8 Repairs of Buildings Dr. to Sundry Accounts.			
0 Company's Rupees 1,41,835-5-5			
For amount of charges under the following heads transferred to this head.			
6 Repairs of Revenue Buildings.....	1,647-	2-6	
6 Repairs of Judicial Buildings.....	8,560-	6-1	
7 Repairs of General Buildings.....	15,570-	14-9	
7 Repairs of Ecclesiastical Buildings.....	2,705-	9-3	
7 Repairs of Marine Buildings.....	1,560-	10-0	
7 Repairs of Military Buildings.....	1,11,790-	10-10	
		1,41,835-	5-5

Madras Public Works Department 30th April 1854.

0	Sundry Accounts Dr. to Repairs of Buildings.			
8	Company's Rupees 1,41,835- 5- 5			
	For amount transferred to the following heads.			
7	Charges General of the Revenue Department.			
	Repairs of Revenue Buildings.....	1,647- 2- 6		
7	Charges General of the Judicial Department.			
	Repairs of Judicial Buildings.....	8,560- 6- 1		
7	Charges General of the General Department.			
	Repairs of General Buildings.....	15,570- 14- 0		
8	Ecclesiastical Department			
	Repairs of Ecclesiastical Buildings.....	2,705- 9- 3		
8	Charges General of the Marine Department.			
	Repairs of Marine Buildings.....	1,560-10- 0		
8	Charges Military.			
	Repairs of Military Buildings.....	1,11,790-10-10		
		1,41,835	5	5
3	General Treasury at Fort St. George Dr. to Remittance of the General Department.			
8	Company's Rupees 2,05,486- 4- 0			
-0	For credit under the former transferred to the latter head.....	2,05,486	4	0
-	Sundry Accounts Dr. to Remittances of the Revenue Department.			
8	Company's Rupees 6,08,439-9-8			
	For credit under the following heads transferred to this head.			
3	Collector of North Arcot.....	1,15,878- 1- 9		
3	Collector of Chingleput.....	1,25,623- 2- 9		
3	Collector of Rajahmundry.....	2,91,661- 0- 2		
3	Collector of Coimbatore.....	75,277- 5- 0		
		6,08,439	9	8
0	Sundry Accounts Dr. to General Books.			
1	Company's Rupees 929,942-14-8			
	To close the following heads.			
8	Remittances of the General Department.....	2,05,486- 4- 0		
8	Remittances of the Revenue Department.....	6,08,439- 9- 8		
3	Military Books.....	1,16,017- 1- 0		
		9,29,942	14	8
1	General Books Dr. to Sundry Accounts.			
0	Company's Rupees 2,73,416-13-8			
	To close the following heads.			
7	Charges General of the Revenue Department.....	97,918-14- 6		
7	Charges General of the Judicial Department.....	8,560- 6- 1		
7	Charges General of the General Department.....	50,880-11- 0		
8	Ecclesiastical Department.....	2,705- 9- 3		
8	Charges General of the Marine Department.....	1,560-10- 0		
8	Charges Military.....	1,11,790-10-10		
		2,73,416	13	8
2	Dead Stock Dr. to Sundry Accounts.			
0	Company's Rupees 80,71,877-10-5			
	To close the following heads.			
2	Irrigation works.....	23,14,737- 3- 0		
2	Communications.....	14,55,384-10- 4		
2	Civil Buildings.....	21,66,412- 6- 8		
2	Buildings Military.....	20,33,843- 6- 5		
2	Store of Public Works Department.....	1,01,500- 0- 0		
		80,71,877	10	5

Madras Public Works Department 30th April 1854.

1	Balance Dr. to Sundry Accounts,			
0	Company's Rupees 82,84,865-10-3			
	For balance outstanding against the following heads.			
2	Dead Stock.....	80,71,877-10- 5		
1	Executive Engineer at the Presidency Division.....	11,308-14- 9		
1	District Engineer of North Arcot....	52,841- 1- 8		
1	District Engineer of Chingleput....	89,811-12-10		
1	District Engineer of Rajahmundry....	33,665- 1- 4		
1	District Engineer of Coimbatore....	25,361- 1- 3		
		2,12,987-15-10		
		82,84,865	10	3
1	General Books Dr. to Balance.			
1	Company's Rupees 82,84,865-10-3			
	For amount transferred to the former head.....	82,84,865	10	3

APPENDIX P.

Form of the Ledger for the Journal in the Appendix O, with an Index.

INDEX TO THE LEDGER.

Balance.....	1 General Books.....	1
Buildings Military.....	2 General Treasury at Fort Saint George.....	3
Buildings Revenue.....	5	
Buildings Judicial.....	5 Irrigation Works.....	2
Buildings General.....	5	
Buildings Ecclesiastical.....	5 Military Books.....	3
Buildings Marine.....	5 Miscellaneous charges on account of Public Works.....	4
Communications.....	2 Public Works Department.....	2
Civil Buildings.....	3 Ports and Harbours.....	4
Collector of North Arcot.....	3 Roads and Bridges.....	4
Collector of Chingleput.....	3 Rail Roads.....	4
Collector of Rajahmundry.....	3 River Navigation.....	4
Collector of Coimbatore.....	4 Repairs of Irrigation Works.....	5
Canals.....	7 Repairs of Roads and Bridges.....	5
Charges General of the Revenue Department.	7 Repairs of Rail Roads.....	6
Charges General of the Judicial Department.	7 Repairs of Ferry Boats.....	6
Charges General of the General Department.	8 Repairs of Canals.....	6
Charges Military.....	8 Repairs of Ports and Harbours.....	6
Charges General of the Marine Department.	8 Repairs of River Navigation.....	6
District Engineer of North Arcot.....	1 Repairs of Revenue Buildings.....	6
District Engineer of Chingleput.....	1 Repairs of Judicial Buildings.....	6
District Engineer of Rajahmundry.....	1 Repairs of General Buildings.....	7
District Engineer of Coimbatore.....	1 Repairs of Ecclesiastical Buildings.....	7
Dead Stock.....	2 Repairs of Marine Buildings.....	7
	Repairs of Military Buildings.....	7
	Repairs of Communications.....	8
Executive Engineer at the Presidency Division.....	1 Repairs of Buildings.....	8
Ecclesiastical Department.....	8 Remittances of the General Department.....	8
	Remittances of the Revenue Department.....	8
Ferry Boats.....	4 Stores of Public Works Department.....	2

(1)
Dr.

BALANCE.

1st May 1853.	1	To General Books.....	1	76,28,339	9	3
30th April 1854.	7	To Sundry accounts.....	0	82,84,865	10	3
				159,13,205	3	6

EXECUTIVE ENGINEER AT THE PRESIDENCY DIVISION.

Dr.

1st May 1853.	1	To Balance.....	1	36,124	3	0
31st Do. 1853.	2	To Public Works Department.....	2	2,05,486	4	0
				2,41,610	7	0

DISTRICT ENGINEER OF NORTH ARCOT.

Dr.

1st May 1853.	1	To Balance.....	1	14,184	14	0
31st Do. 1853.	2	To Public Works Department.....	2	1,85,895	2	9
				2,00,080	0	9

DISTRICT ENGINEER OF CHINGLEPUT.

Dr.

1st May 1853.	1	To Balance.....	1	11,965	6	0
31st Do. 1853.	2	To Public Works Department.....	2	1,71,623	2	9
				1,83,588	8	9

DISTRICT ENGINEER OF RAJAHMUNDRY.

Dr.

1st May 1853.	1	To Balance.....	1	39,185	13	2
31st Do. 1853.	2	To Public Works Department.....	2	2,91,661	0	2
				3,30,846	13	4

DISTRICT ENGINEER OF COIMBATORE.

Dr.

1st May 1853.	1	To Balance.....	1	15,668	15	1
31st Do. 1853.	2	To Public Works Department.....	2	75,277	5	0
				90,946	4	1

GENERAL BOOKS.

Dr.

30th April 1854.	6	To Sundry accounts.....	0	2,73,416	13	8
Do.	7	To Balance.....	1	82,84,865	10	3
				85,58,282	7	11

(1)

CONTRA.

Cr.

1st May 1853.	1	By Sundry Accounts.....	0	76,28,339	9	3
30th April 1854.	7	By General Books.....	1	82,84,865	10	3
				159,13,205	3	6

CONTRA.

Cr.

31st May 1853.	2	By Public Works Department.....	2	2,30,301	8	3
30th April 1854.	7	By Balance.....	1	11,308	14	9
				2,41,610	7	0

CONTRA.

Cr.

31st May 1853.	2	By Public Works Department.....	2	1,47,238	15	1
30th April 1854.	7	By Balance.....	1	52,841	1	8
				2,00,080	0	9

CONTRA.

Cr.

31st May 1853.	2	By Public Works Department.....	2	93,776	11	11
30th April 1854.	7	By Balance.....	1	89,811	12	10
				1,83,588	8	9

CONTRA.

Cr.

31st May 1853.	2	By Public Works Department.....	2	2,97,181	12	0
30th April 1854.	7	By Balance.....	1	33,665	1	4
				3,30,846	13	4

CONTRA.

Cr.

31st May 1853.	2	By Public Works Department.....	2	65,585	2	10
30th April 1854.	7	By Balance.....	1	25,361	1	3
				90,946	4	1

CONTRA.

Cr.

1st May 1853.	1	By Balance.....	1	76,28,339	9	3
30th April 1854.	6	By Sundry Accounts.....	0	9,29,942	14	8
				85,58,282	7	11

172

(2)

IRRIGATION WORKS.

1st May 1853.	1	To Dead Stock.....	2	20,00,000	0	0
31st Do. 1853.	2	To Public Works Department.....	2	3,14,737	3	0
				23,14,737	3	0

COMMUNICATIONS.

1st May 1853.	1	To Dead Stock.....	2	13,00,000	0	0
30th April 1854.	5	To Sundry Accounts.....	0	1,57,349	12	4
				14,57,349	12	4

CIVIL BUILDINGS.

1st May 1853.	1	To Dead Stock.....	2	20,99,049	2	0
30th April 1854.	5	To Sundry Accounts.....	0	67,363	4	8
				21,66,412	6	8

BUILDINGS MILITARY.

1st May 1853.	1	To Dead Stock.....	2	20,12,161	4	0
31st Do. 1853.	4	To Public Works Department.....	2	21,682	2	5
				20,33,843	6	5

STORES OF PUBLIC WORKS DEPARTMENT.

1st May 1853.	1	To Dead Stock.....	2	1,00,000	0	0
31st Do. 1853.	4	To Public Works Department.....	2	1,500	0	0
				1,01,500	0	0

DEAD STOCK.

1st May 1853.	1	To Balance	1	75,11,210	6	0
30th April 1854.	6	To Sundry Accounts.....	0	80,71,877	10	5
				1,55,83,088	0	5

PUBLIC WORKS DEPARTMENT.

31st May 1853.	1	To Sundry Accounts.....	0	9,29,942	14	8
Do.	2	To Sundry Accounts.....	0	8,34,084	2	1
				17,64,027	0	9

(2)

CONTRA.

Cr.

30th April 1854.	6	By Dead Stock.....	2	23,14,737	3	0
				23,14,737	3	0

CONTRA.

Cr.

30th April 1854.	6	By Charges General of the General Department.....	7	1,965	2	0
Do.	6	By Dead Stock.....	2	14,55,384	10	4
				14,57,349	12	4

CONTRA.

Cr.

30th April 1854.	6	By Dead Stock.....	2	21,66,412	6	8
				21,66,412	6	8

CONTRA.

Cr.

30th April 1854.	6	By Dead Stock.....	2	20,33,843	6	5
				20,33,843	6	5

CONTRA.

Cr.

30th April 1854.	6	By Dead Stock.....	2	1,01,500	0	0
				1,01,500	0	0

CONTRA.

Cr.

1st May 1853.	1	By Sundry Accounts.....	0	75,11,210	6	0
30th April 1854.	7	By Balance.....	1	80,71,877	10	5
				1,55,83,088	0	5

CONTRA.

Cr.

31st May 1853.	2	By Sundry Accounts.....	0	9,29,942	14	8
Do.	2	By Sundry Accounts.....	0	8,34,084	2	1
				17,64,027	0	9

GENERAL TREASURY AT FORT ST. GEORGE.

Dr. (3)

30th April 1854.	6 To Remittances of the General Department.....	8	2,05,486	4	0
------------------	---	---	----------	---	---

COLLECTOR OF NORTH ARCOT.

Dr.

30th April 1854.	6 To Remittances of the Revenue Department.....	8	1,15,878	1	9
------------------	---	---	----------	---	---

COLLECTOR OF CHINGLEPUT.

Dr.

30th April 1854.	6 To Remittances of the Revenue Department.....	8	1,25,623	2	9
------------------	---	---	----------	---	---

COLLECTOR OF RAJAHMUNDY.

Dr.

30th April 1854.	6 To Remittances of the Revenue Department.....	8	2,91,661	0	2
------------------	---	---	----------	---	---

COLLECTOR OF COIMBATORE.

Dr.

30th April 1854.	6 To Remittances of the Revenue Department.....	8	75,277	5	0
------------------	---	---	--------	---	---

MILITARY BOOKS.

Dr.

30th April 1854.	6 To General Books.....	1	1,16,017	1	0
------------------	-------------------------	---	----------	---	---

(3)

CONTRA.

Cr.

31st May 1853.	1 By Public Works Department.....	2	2,05,486	4	0
----------------	-----------------------------------	---	----------	---	---

CONTRA.

Cr.

31st May 1853.	1 By Public Works Department.....	2	1,15,878	1	9
----------------	-----------------------------------	---	----------	---	---

CONTRA.

Cr.

31st May 1853.	1 By Public Works Department.....	2	1,25,623	2	9
----------------	-----------------------------------	---	----------	---	---

CONTRA.

Cr.

31st May 1853.	1 By Public Works Department.....	2	2,91,661	0	2
----------------	-----------------------------------	---	----------	---	---

CONTRA.

Cr.

31st May 1853.	2 By Public Works Department.....	2	75,277	5	0
----------------	-----------------------------------	---	--------	---	---

CONTRA.

Cr.

31st May 1853.	1 By Public Works Department.....	2	1,16,017	1	0
----------------	-----------------------------------	---	----------	---	---

MISCELLANEOUS CHARGES ON ACCOUNT OF PUBLIC WORKS.

(4)
Dr.

31st May 1853.	4 To Public Works Department.....	2	1,335	6	0
----------------	-----------------------------------	---	-------	---	---

ROADS AND BRIDGES.

Dr.

31st May 1853.	2 To Public Works Department.....	2	82,113	3	0
----------------	-----------------------------------	---	--------	---	---

RAIL ROADS.

Dr.

31st May 1853.	2 To Public Works Department.....	2	58,960	6	0
----------------	-----------------------------------	---	--------	---	---

FERRY BOATS.

Dr.

31st May 1853.	2 To Public Works Department.....	2	1,965	2	0
----------------	-----------------------------------	---	-------	---	---

CANALS.

Dr.

31st May 1853.	2 To Public Works Department.....	2	9,441	12	4
----------------	-----------------------------------	---	-------	----	---

PORTS AND HARBOURS.

Dr.

31st May 1853.	2 To Public Works Department.....	2	1,269	5	0
----------------	-----------------------------------	---	-------	---	---

RIVER NAVIGATION.

Dr.

31st May 1853.	2 To Public Works Department.....	2	3,600	0	0
----------------	-----------------------------------	---	-------	---	---

(4)

CONTRA.

Cr.

30th April 1854.	6 By Charges General of the General Department.....	7	1,935	6	0
------------------	---	---	-------	---	---

CONTRA.

Cr.

30th April 1854.	5 By Communications.....	2	82,113	3	0
------------------	--------------------------	---	--------	---	---

CONTRA.

Cr.

30th April 1854.	5 By Communications.....	2	58,960	6	0
------------------	--------------------------	---	--------	---	---

CONTRA.

Cr.

30th April 1854.	5 By Communications.....	2	1,965	2	0
------------------	--------------------------	---	-------	---	---

CONTRA.

Cr.

30th April 1854.	5 By Communications.....	2	9,441	12	4
------------------	--------------------------	---	-------	----	---

CONTRA.

Cr.

30th April 1854.	5 By Communications.....	2	1,269	5	4
------------------	--------------------------	---	-------	---	---

CONTRA.

Cr.

30th April 1854.	5 By Communications.....	2	3,600	0	0
------------------	--------------------------	---	-------	---	---

175

BUILDINGS REVENUE.			Dr. (5)		
31st May 1853.	3 To Public Works Department.....	2	281	6	7
BUILDINGS JUDICIAL.			Dr.		
31st May 1853.	3 To Public Works Department.....	2	862	14	8
BUILDINGS GENERAL.			Dr.		
31st May 1853.	3 To Public Works Department.....	2	3,108	13	6
BUILDINGS ECCLESIASTICAL.			Dr.		
31st May 1853.	3 To Public Works Department.....	2	3,508	12	5
BUILDINGS MARINE.			Dr.		
31st May 1853.	3 To Public Works Department.....	2	59,601	5	6
REPAIRS OF IRRIGATION WORKS.			Dr.		
31st May 1853.	3 To Public Works Department.....	2	96,271	12	0
REPAIRS OF ROADS AND BRIDGES.			Dr.		
31st May 1853.	3 To Public Works Department.....	2	25,367	2	0

(5)

CONTRA.			Cr.		
30th April 1854.	5 By Civil Buildings.....	2	281	6	7
CONTRA.			Cr.		
30th April 1854.	5 By Civil Buildings.....	2	862	14	8
CONTRA.			Cr.		
30th April 1854.	5 By Civil Buildings.....	2	3,108	13	6
CONTRA.			Cr.		
30th April 1854.	5 By Civil Buildings.....	2	3,508	12	5
CONTRA.			Cr.		
30th April 1854.	5 By Civil Buildings.....	2	59,601	5	6
CONTRA.			Cr.		
30th April 1854.	4 By Charges General of the Revenue Department.....	7	96,271	12	0
CONTRA.			Cr.		
30th April 1854.	5 By repairs of Communications.....	8	25,367	2	0

REPAIRS OF RAIL ROADS.

(6)
Dr.

31st May 1853.	3	To Public Works Department.....	2	3,609	7	0
----------------	---	---------------------------------	---	-------	---	---

REPAIRS OF FERRY BOATS.

Dr.

31st May 1853.	3	To Public Works Department.....	2	727	4	3
----------------	---	---------------------------------	---	-----	---	---

REPAIRS OF CANALS.

Dr.

31st May 1853.	3	To Public Works Department.....	2	758	9	0
----------------	---	---------------------------------	---	-----	---	---

REPAIRS OF PORTS AND HARBOURS.

Dr.

31st May 1853.	3	To Public Works Department.....	2	379	6	0
----------------	---	---------------------------------	---	-----	---	---

REPAIRS OF RIVER NAVIGATION.

Dr.

31st May 1853.	3	To Public Works Department.....	2	567	8	0
----------------	---	---------------------------------	---	-----	---	---

REPAIRS OF REVENUE BUILDINGS.

Dr.

31st May 1853.	3	To Public Works Department.....	2	1,647	2	6
----------------	---	---------------------------------	---	-------	---	---

REPAIRS OF JUDICIAL BUILDINGS.

Dr.

31st May 1853.	3	To Public Works Department.....	2	8,560	6	1
----------------	---	---------------------------------	---	-------	---	---

(6)

CONTRA.

Cr.

30th April 1854.	5	By Repairs of Communications.....	8	3,609	7	0
------------------	---	-----------------------------------	---	-------	---	---

CONTRA.

Cr.

30th April 1854.	5	By Repairs of Communications.....	8	727	4	3
------------------	---	-----------------------------------	---	-----	---	---

CONTRA.

Cr.

30th April 1854.	5	By Repairs of Communications.....	8	758	9	0
------------------	---	-----------------------------------	---	-----	---	---

CONTRA.

Cr.

30th April 1854.	5	By Repairs of Communications.....	8	379	6	0
------------------	---	-----------------------------------	---	-----	---	---

CONTRA.

Cr.

30th April 1854.	5	By Repairs of Communications.....	8	567	8	0
------------------	---	-----------------------------------	---	-----	---	---

CONTRA.

Cr.

30th April 1854.	5	By Repairs of Buildings.....	8	1,647	2	6
------------------	---	------------------------------	---	-------	---	---

CONTRA.

Cr.

30th April 1854.	5	By Repairs of Buildings.....	8	8,560	6	1
------------------	---	------------------------------	---	-------	---	---

REPAIRS OF GENERAL BUILDINGS.				Dr. (7)			
31st May 1853.	4	To Public Works Department.....	2	15,570	14	9	
REPAIRS OF ECCLESIASTICAL BUILDINGS.				Dr.			
31st May 1853.	5	To Public Works Department.....	2	2,705	9	3	
REPAIRS OF MARINE BUILDINGS.				Dr.			
31st May 1853.	5	To Public Works Department.....	2	1,560	10	0	
REPAIRS OF MILITARY BUILDINGS.				Dr.			
31st May 1853.	5	To Public Works Department.....	2	1,11,790	10	10	
CHARGES GENERAL OF THE REVENUE DEPARTMENT.				Dr.			
30th April 1854.	4	To Repairs of Irrigation works.....	5	96,271	12	0	
Do.	6	To Repairs of Buildings.....	8	1,647	2	6	
				97,918	14	6	
CHARGES GENERAL OF THE JUDICIAL DEPARTMENT.				Dr.			
30th April 1854.	6	To Repairs of Buildings.....	8	8,560	6	1	
CHARGES GENERAL OF THE GENERAL DEPARTMENT.				Dr.			
30th April 1854.	6	To Sundry Accounts.....	0	35,309	12	3	
Do.	6	To Repairs of Buildings.....	8	15,570	14	9	
				50,880	11	0	

(7) - CONTRA.				Cr.			
30th April 1854.	5	By Repairs of Buildings.....	8	15,570	14	9	
CONTRA.				Cr.			
30th April 1854.	5	By Repairs of Buildings.....	8	2,705	9	3	
CONTRA.				Cr.			
30th April 1854.	5	By Repairs of Buildings.....	8	1,560	10	0	
CONTRA.				Cr.			
30th April 1854.	5	By Repairs of Buildings.....	8	1,11,790	10	10	
CONTRA.				Cr.			
30th April 1854.	6	By General Books.....	1	97,918	14	6	
				97,918	14	6	
CONTRA.				Cr.			
30th April 1854.	6	By General Books.....	1	8,560	6	1	
CONTRA.				Cr.			
30th April 1854.	6	By General Books.....	1	50,880	11	0	
				50,880	11	0	

CHARGES MILITARY.				Dr. (8)	
30th April 1854.	6	To Repairs of Buildings.....	8	1,11,790	10 10
REPAIRS OF COMMUNICATIONS.				Dr.	
30th April 1854.	5	To Sundry Accounts.....	0	31,409	4 3
REPAIRS OF BUILDINGS.				Dr.	
30th April 1854.	6	To Sundry Accounts.....	0	1,41,835	5 5
ECCLESIASTICAL DEPARTMENT.				Dr.	
30th April 1854.	6	To Repairs of Buildings.....	8	2,705	9 3
CHARGES GENERAL OF THE MARINE DEPARTMENT.				Dr.	
30th April 1854.	6	To Repairs of Buildings.....	8	1,560	10 0
REMITTANCES OF THE GENERAL DEPARTMENT.				Dr.	
30th April 1854.	6	To General Books.....	1	2,05,486	4 6
REMITTANCES OF THE REVENUE DEPARTMENT.				Dr.	
30th April 1854.	6	To General Books.....	1	6,08,439	9 3

CONTRA.				Cr.	
30th April 1854.	6	By General Books.....	1	1,11,790	10 10
CONTRA.				Cr.	
30th April 1854.	6	By Charges General of the General Department.....	7	31,409	4 3
CONTRA.				Cr.	
30th April 1854.	6	By Sundry Accounts.....	0	1,41,835	5 5
CONTRA.				Cr.	
30th April 1854.	6	By General Books.....	1	2,705	9 3
CONTRA.				Cr.	
30th April 1854.	6	By General Books.....	1	1,560	10 0
CONTRA.				Cr.	
30th April 1854.	6	By General Treasury at Fort St. George.....	3	2,05,486	4 6
CONTRA.				Cr.	
30th April 1854.	6	By Sundry Accounts.....	0	6,08,439	9 3

APPENDIX Q.

Statement showing the periods elapsing between the several steps in the progress to audit, in the case of the bills for ordinary repair of Irrigation works in certain districts for certain years.

Year.	Amount of the Bills.	No. of separate Bills or works in each list.	Date on which the works were completed.	Number of days from					Date of completion to Government sanction of the Bill.	
				The completion of the work to the despatch of the Bill to the Civil Engineer.	Despatch of Bill to the Civil Engineer to its receipt by the Board of Revenue.	Receipt by the Board of Revenue to its submission to Government.	Submission to Government to date of sanction.			
1	2	3	4	5	6	7	8	9		
South Arcot.	North Arcot.	1845	5,722 10 0	62	30th Sep. 1845	538	54	72	15	679
		1846	14,604 11 9	101	Do. 1846	315	59	242	14	630
		1847	65,577 7 3	310	Do. 1847	652	10	78	20	766
		1848	62,516 9 9	324	Do. 1848	407	8	295	35	745
		1849	45,508 6 9	239	Do. 1849	391	40	297	66	794
	Average..				461	34	197	30	722	
	5th Division.	1845	21,502 0 6	175	30th Sep. 1845	281	34	217	8	540
		1846	25,234 8 4	214	Do. 1846	374	28	310	60	772
		1847	13,704 1 1	153	Do. 1847	351	65	210	22	648
		1848	33,989 10 9	343	Do. 1848	331	42	372	29	774
		1849	14,550 13 4	186	Do. 1849	368	28	368	30	794
	Average..				341	39	295	30	706	
	6th Division.	1845	5,011 4 6	56	30th Sep. 1845	271	47	214	8	540
		1846	4,907 9 3	63	Do. 1846	386	35	160	11	592
		1847	1,465 14 7	23	Do. 1847	360	99	154	12	625
		1848	14,141 1 4	71	Do. 1848	343	30	372	29	774
		1849	15,336 2 6	91	Do. 1849	361	35	368	30	794
	Average..				344	49	254	18	665	
	Salem.	1845	8,360 4 0	140	30th Sep. 1845	331	28	272	10	641
1846		5,503 7 0	100	Do. 1846	382	67	165	14	628	
1847		9,349 9 0	204	Do. 1847	440	89	200	19	748	
1848		8,185 7 0	214	Do. 1848	385	58	321	44	808	
1849		10,417 0 0	217	Do. 1849	444	105	168	68	785	
Average..				396	69	225	31	722		
Cuntoor.	1845	12,703 0 10	26	30th Sep. 1845	261	21	243	15	540	
	1846	13,556 4 11	106	Do. 1846	301	17	317	11	646	
	1847	28,113 15 2	159	Do. 1847	322	15	300	26	663	
	1848	23,115 7 0	170	Do. 1848	267	104	271	22	664	
	1849	12,590 8 0	164	Do. 1849	355	17	363	59	794	
Average..				301	35	299	27	661		
Trichinopoly.	1845	45,734 15 11	390	30th Sep. 1845	270	41	208	17	536	
	1846	31,690 10 5	273	Do. 1846	290	40	279	22	631	
	1847	29,770 3 10	303	Do. 1847	432	52	236	15	735	
	1848	42,648 8 5	320	Do. 1848	393	40	356	67	861	
	1849	40,486 1 1	302	Do. 1849	435	62	212	22	731	
Average..				365	47	258	29	699		
General Average..				368	45	255	27	696		

APPENDIX R.

Statement showing the time that elapsed between the several steps in the progress of certain Occasional works in the Revenue Department, from the date of Estimate to the final sanction of the Bill.

Amount of Estimate.	Date of Estimate.	Number of days from												
		The date of the Estimate to the sanction of the Estimate.	The date of sanction to the completion of work.	Completion of work to Receipt of Bill from Collector.	Receipt of Bill by Collector to the Civil Engineer.	Completion of the work to the despatch of the Bill from the Collector's Office.	Despatch of Bill to Civil Engineer to receipt of Bill in Board's Office.	The Board's Receipt of the Bill to its submission to Government.	Submission to Government for sanction to Government.	Total days from completion of work to submission of Bill to Government.	Date of Bill to Government.	Date of Bill to the despatch of the Bill to the Civil Engineer.		
1	2	3	4	5	6	7	8	9	10	11	12	13		
Rs. A.P.														
222 10 0	31st Dec. 1847.	73	552	195	110	305	35	327	65	782	1,359	857		
207 13 0	"	73	329	60	207	267	35	327	65	694	1,096	595		
240 10 0	"	73	263	54	275	329	35	327	65	756	1,092	592		
289 13 0	"	73	149	471	324	795	35	327	65	1,222	1,435	935		
254 3 0	"	73	175	469	309	778	35	327	65	1,205	1,453	953		
466 7 6	"	73	366	36	300	386	35	327	65	813	1,452	952		
219 2 0	"	73	229	336	369	705	35	327	65	1,132	1,434	934		
304 8 0	"	73	414	170	372	542	35	327	65	869	1,486	986		
200 9 0	"	73	476	246	328	429	35	327	65	903	1,452	952		
261 0 0	"	73	524	101	379	524	35	327	65	856	1,453	953		
226 13 0	"	73	402	145	379	375	35	327	65	951	1,426	926		
322 14 0	"	73	686	144	231	375	35	327	65	805	1,461	961		
316 12 0	"	73	621	14	321	335	35	327	65	762	1,456	956		
271 11 0	"	73	194	47	685	732	35	327	65	1,159	1,426	926		
390 14 0	"	73	230	58	665	723	35	327	65	1,150	1,453	953		
346 9 0	"	73	315	228	319	547	35	327	65	974	1,362	862		
481 12 0	"	73	595	78	249	327	35	327	65	741	1,422	922		
203 0 0	"	73	226	147	561	708	35	327	65	1,135	1,428	928		
221 10 0	"	73	580	12	353	365	35	327	65	795	1,445	945		
3,683 11 0	10th Feby. 1848.	48	313	60	542	602	35	327	65	1,029	1,390	915		
242 14 0	4th Dec. 1847.	70	603	360	27	387	35	327	65	814	1,487	990		
385 8 0	12th Feby. 1847.	37	152	69	369	438	35	327	65	865	1,054	599		
	12th Feby. 1849.	37	322	71	192	263	35	327	65	690	1,049	585		
Average..		69	384	157	335	493	35	327	65	915	1,373	877		

Occasional works of Irrigation.

North Arcot.

Occasional works of Irrigation.
North Arcot.

1	2	3	4	5	6	7	8	9	10	11	12	13	
South Arcot.	269 14 8	502	185	179	224	403	30	379	31	843	1,530	588	
	524 15 3	1,853	1,025	64	209	273	50	379	31	713	3,591	1,298	
	244 9 0	165	202	181	337	518	74	244	31	867	1,234	720	
	259 12 0	683	192	371	159	530	74	244	31	879	1,754	722	
	327 10 0	651	192	371	159	530	74	244	31	879	1,722	722	
	Average..	771	359	233	218	451	56	298	31	836	1,966	810	
	Salem.	526 8 0	69	975	61	306	370	25	238	68	701	1,745	1,345
		325 4 0	285	615	319	175	494	35	570	27	1,126	2,026	1,109
		2,421 5 0	76	941	258	244	502	78	240	22	842	1,353	1,443
		286 14 0	32	565	300	263	503	78	210	22	903	1,520	1,128
228 1 0		57	202	190	257	447	78	240	22	787	1,106	709	
213 13 0		57	232	227	244	471	78	240	22	811	1,100	703	
1,200 0 0		57	262	197	244	441	78	240	22	720	1,100	703	
345 8 0		57	323	117	263	380	78	240	22	750	1,100	703	
842 2 0		57	293	104	306	410	78	240	22	750	1,100	703	
688 14 0		57	293	104	306	410	78	240	22	750	1,100	703	
Trichinopoly.	1,873 1 0	57	354	43	306	349	78	240	22	689	1,100	703	
	919 14 0	71	893	211	266	517	78	240	22	857	1,521	1,410	
	453 15 0	48	624	266	251	517	78	240	22	857	1,529	1,141	
	213 0 0	422	233	203	263	471	78	240	22	811	1,466	704	
	1,556 11 0	39	815	31	501	532	78	240	22	872	1,726	1,347	
	Average..	99	479	184	281	465	75	261	22	825	1,403	944	
	Guntur.	255 12 0	257	571	2	92	34	5	339	23	402	1,210	605
		199 12 0	82	875	11	21	35	26	318	23	402	1,359	910
		219 7 0	82	875	29	23	57	25	303	23	408	1,365	932
		424 14 0	74	848	6	20	26	25	303	23	377	1,299	874
918 5 0		74	817	13	22	35	5	339	23	402	1,293	852	
272 6 0		74	786	30	13	43	15	354	23	435	1,295	829	
353 1 0		74	786	30	13	43	15	354	23	435	1,295	829	
1,768 14 0		74	786	30	13	43	15	354	23	430	1,290	829	
2,162 5 0		193	544	2	162	161	15	354	23	556	1,293	708	
156 3 0		237	510	16	89	105	15	354	23	497	1,244	615	
Occasional Works of Irrigation (Continued.)	156 3 0	237	510	16	89	105	15	354	23	497	1,244	615	
	616 7 0	237	602	11	46	57	25	303	23	408	1,247	659	
Average..	140	709	10	46	62	62	17	335	23	437	1,286	771	

Occasional works not of Irrigation (Continued.)

1	2	3	4	5	6	7	8	9	10	11	12	13
310 4 5 562 11 0 117 7 11 614 1 0 2,245 15 2 613 2 0 251 10 3 412 13 1 475 5 9 475 5 9 475 5 9 353 13 6 306 2 9 368 14 0 2,845 9 3 180 3 0 251 12 2 223 1 2 368 1 5	3d Aug. 1848. 5th Oct. 1846. Do. 2d Nov. 1846. 19th Sept. 1846. 17th June 1847. 11th Sept. 1847. 17th June 1847. Do. Do. Do. 8th May 1847. 21st July 1848. 17th April 1848. 26th Oct. 1846. 16th Aug. 1848. 1st April 1848. Do. 8th May 1847.	53 132 136 107 49 132 47 131 131 131 170 244 255 110 99 203 203 60	66 292 92 715 715 698 805 776 365 332 379 854 407 281 835 277 319 344 929	80 243 205 1,089 359 47 51 75 22 51 6 85 269 235 497 437 378 362 280	162 60 619 69 89 354 195 209 723 723 729 137 306 102 1 1 8 8 7	242 303 824 1,157 398 401 245 284 745 735 222 515 327 438 438 386 370 287	13 18 20 20 27 14 14 14 14 14 14 14 14 14 14 14 14 14	340 268 280 280 224 338 388 388 388 388 388 388 388 388 388 388 388 388	15 15 16 16 45 29 29 29 29 29 29 29 29 29 29 29 29 29	615 604 1,140 1,473 694 832 681 715 1,176 1,672 1,668 1,676 1,677 1,597 1,294 869 1,245 869 817 801 718	734 1,028 1,368 2,295 1,458 1,662 1,529 1,622 1,672 1,668 1,676 1,677 1,597 1,294 1,814 1,273 715 705 714 1,216	308 595 916 1,872 1,113 1,099 1,051 1,060 1,106 1,114 1,076 922 608 1,273 715 705 714 1,216
190 7 0 243 2 6 673 1 0 352 13 0 2,171 13 0 16,170 11 0 1,372 14 0 1,874 2 8 367 0 0 2,296 11 0	Average.. 5th Dec. 1846. 20th Nov. 1847. 1st June 1849. 19th Dec. 1848. 11th May 1848. 1st Nov. 1846. 11th Sept. 1847. 15th Nov. 1848. 12th Jan. 1849. 31st Aug. 1848.	458 646 22 63 227 81 80 51 96 114	665 116 164 316 375 1,075 763 361 167 282	244 140 140 140 207 207 207 207 134 299	234 134 134 134 159 159 159 159 324 159	479 274 274 274 366 366 366 366 458 458	16 30 30 30 73 73 73 73 73 73	359 440 440 440 266 266 266 266 266 266	27 20 22 20 62 62 62 62 62 62	881 764 806 764 764 767 767 767 859 859 859	1,512 1,887 1,568 950 1,143 1,369 1,923 1,610 1,179 1,122 1,255	978 939 390 433 590 741 1,441 1,129 727 625 740
731 3 6 360 9 0 1,701 11 6 281 4 2 201 6 5 400 11 6	Average.. 11th Mar. 1844. 8th Aug. 1848. 17th June 1844. 14th Sept. 1847. Do. 28th Dec. 1848.	397 28 79 142 71 45	1,724 217 697 697 769 325	66 284 16 42 42 13	304 351 348 338 398 351	370 636 364 370 370 364	25 25 25 25 25 25	364 364 303 364 364 364	26 26 26 26 26 26	785 1,050 731 785 785 779	1,400 2,906 1,295 2,745 1,624 1,625 1,149	776 2,094 852 2,302 1,067 1,139 689
127	Average..	127	946	77	335	412	25	354	26	818	1,891	1,358

Occasional works not of Irrigation.

1	2	3	4	5	6	7	8	9	10	11	12	13			
Occasional works not of Irrigation (Continued.)	Trichinopoly.	993 3 0	21 Nov. 1847.	22	615	221	218	439	78	222	23	762	1,399	1,054	
		1,035 8 6	30th Jan. 1849.	20	163	221	218	439	78	222	23	762	945	602	
		335 0 0	21st Mar. 1849.	118	14	290	211	501	78	222	23	824	956	515	
		487 7 0	23d Nov. 1848.	52	199	179	322	501	78	222	23	824	1,075	700	
		315 0 0	6th Mar. 1848.	30	484	239	263	502	78	222	23	825	1,339	986	
		261 10 0	23d June 1849.	41	183	68	281	319	78	222	23	672	896	532	
		213 9 0	18th Feb. 1846.	749	513	203	329	532	78	222	23	835	2,117	1,045	
		Average..													
		Guntoor.	480 0 0	4th Feb. 1846.	85	978	19	50	60	49	459	16	581	1,647	1,047
			303 8 0	4th April 1847.	69	764	30	24	54	8	265	22	349	1,182	818
437 0 0	15th April 1847.		237	449	207	230	437	15	443	23	918	1,604	836		
150 0 0	17th Nov. 1846.		82	845	30	63	93	27	318	23	461	1,388	938		
4,877 11 0	15th Oct. 1846.		125	714	120	88	268	3	324	16	551	1,390	922		
1,714 6 0	23rd Jan. 1847.		45	838	17	9	26	5	324	16	371	1,317	924		
157 4 0	28th Oct. 1847.		96	518	7	27	34	9	343	16	402	1,016	532		
86 9 0	8th July. 1848.		81	248	42	23	65	5	290	22	382	711	313		
Average..															
103 677 59 64 123 15 345 19 502 1,282 800															
ABSTRACT.															
Works of Irrigation.															
North Arcot.....	23	Rs. 10,706 15 6	69	381	157	335	493	55	327	65	915	877			
South Arcot.....	5	1,626 12 11	771	359	233	213	451	56	298	31	836	810			
Salem.....	1	536 8 0	69	975	64	306	370	25	238	68	701	1,345			
Trichinopoly.....	14	11,201 6 0	99	479	184	281	465	75	264	22	825	941			
Guntoor.....	12	7,503 9 0	140	709	16	46	62	17	335	23	437	771			
Average.....			230	581	131	237	368	42	292	42	743	949			
Works not of Irrigation.															
North Arcot.....	19	11,451 11 4	133	499	244	231	479	16	359	27	881	978			
South Arcot.....	10	25,685 11 2	184	428	182	166	448	56	336	49	788	776			
Salem.....	6	3,676 4 7	127	946	77	335	412	25	354	26	818	1,358			
Trichinopoly.....	7	3,641 5 0	147	310	203	263	466	78	222	23	789	776			
Guntoor.....	8	8,256 6 0	103	677	59	61	123	15	345	19	502	900			
Average.....			139	572	153	212	368	38	323	29	756	938			
General Average.....			181	576	142	224	367	40	307	35	749	944			

APPENDIX S.

Statement showing the time elapsing between the various stages in the progress of certain bills to audit in the Road Department.

Description of Work.	No. of Bills in each Abstract.	Amount of each Abstract.	Period to which the Bills refer.	Number of days from		
				Completion to date on which the Bills were sent to Government from Suppl.'s Office.	Date of submission to date of sanction.	From the completion to date of sanction.
I						
1849.						
For the maintenance of the Northern Trunk Road from Goundipoondy and Nellore.....	8	Rs. 2,016 10 7	1st Nov. 1846 to 30th April 1847	944	25	969
Do.....	15	1,748 8 4	1st May to 31st October 1847	764	25	789
Do.....	18	4,527 15 2	1st Nov. 1847 to 30th April 1848	224	25	249
Do.....	8	599 3 11	1st Nov. 1846 to 30th April 1847	944	25	969
Do.....	11	754 13 7	1st May to 31st October 1847	764	25	789
Do.....	36	9,572 14 10	1st Nov. 1847 to 30th April 1848	584	25	609
Do.....	6	190 7 7	1st May to 31st October 1847	764	25	789
For marking out the Northern Trunk Road.....						
1850.						
For the maintenance of 1st and 2d Division of the Mercara Road..	17	1,192 13 10	1st May to 31st October 1846	1,179	18	1,197
Do.....	36	1,387 8 6	1st Nov. 1846 to 30th April 1847	999	18	1,017
Do.....	21	1,387 3 9	1st Nov. 1847 to 30th April 1848	639	18	657
Do.....	24	1,907 12 2	1st May to 31st October 1847	819	18	837
Do.....	32	1,575 1 0	1st May to 31st October 1848	459	18	477
Do.....	28	1,380 0 0	1st Nov. 1848 to 30th April 1849	279	18	297
Do.....	84	5,130 10 2	1st May 1846 to 30th April 1849	279	18	297
Do, of the 3d Division.....	3	897 4 11	1st May 1846 to 30th April 1849	38	19	57
For marking out Trunk Roads.....	113	18,128 15 5	1st Oct. 1848 to 31st December 1849	279	19	298
For the construction of the Southern Trunk Road.....	123	19,774 15 11	1st Nov. 1848 to 31st October 1848	459	19	478
Do.....						

APPLIED

APPENDIX F.

Official year.	Name of the station.	Number according to the Registry of the Military Auditor General.	Amount of each bill.	Number of days from										
				Date of sanction to date of first advance to the work.	Date of first advance to the survey.	Date of survey to date of the bill.	Date of the bill to date of receipt by the Chief Engineer.	Date of the receipt of the bill by the Chief Engineer to date of despatch by him to the Military Board.	Date of receipt of bill by the Military Board, to date on which the bills were sanctioned by them or submitted to Court.	Date of submission to Government to date of sanction.	Date on which the bills were passed by the Military Board.	Date when passed by Military Auditor General to date of adjustment in the A. G. O. viz. to the issue of order for the bill to be taken credit or to reverse balance of their bills.	Date of sanction of the bill by the Military Board.	Date of survey to date of the bill.
1		3	4	5	6	7	8	9	10	11	12	13	14	15
1849-50	Bellary.....	6	37110	3	32	108	79	13	22	20	118	29	144	291
20	Guntur.....	7	334	3	7	227	1	64	9	14	87	32	95	214
21	Do.	8	236	14	106	14	29	29	8	11	27	22	73	122
22	Arcon.....	10	128	0	4	75	42	11	12	11	27	0	88	115
23	Paughant	12	775	3	27	143	1	134	6	135	38	0	296	334
24	Chary.....	46	1356	12	46	255	238	6	59	0	69	14	334	417
25	Do.	54	1647	11	41	96	168	32	18	18	69	14	250	333
26	Secunderabad	76	80	2	0	4	160	32	18	0	84	14	228	326
27	Do.	78	63	8	0	0	132	32	18	18	84	14	200	298
28	Do.	122	2300	0	47	88	93	17	39	24	135	48	187	370
29	Madras.....	134	1767	10	116	175	58	12	42	27	76	43	146	270
30	Do.	141	888	13	118	280	7	36	11	21	103	30	89	222
31	Do.	147	3588	10	25	123	15	13	5	23	83	30	70	183
32	Do.	320	299	3	36	144	89	17	76	25	118	31	251	400
33	Do.	11	530	0	21	299	43	11	24	62	121	0	140	261
34	Coimbatore..	14	834	0	51	974	1	18	6	52	110	0	95	205
35	Rannad.....	72	1532	3	117	365	139	23	68	162	51	0	406	457
36	Manupatan..	95	451	11	425	115	3	18	7	142	120	0	159	279
37	Velore.....	218	56	0	29	139	1	13	8	78	91	0	105	196
38	Panacottah..	11	101	13	45	55	26	35	35	30	240	30	104	374
39	Madras.....	22	20236	15	35	1401	60	9	19	0	138	0	216	354
40	Mercara.....	34	547	5	56	34	135	9	15	0	90	20	302	412
41	Rannad.....	46	36	1	246	260	1	19	42	25	136	0	87	223
42	Arcon.....	66	1187	10	517	75	1	13	13	0	17	89	112	218
43	Secunderabad	138	417	11	24	114	359	8	17	136	184	34	535	753
44	Rangalore...	158	847	8	25	150	144	23	50	0	156	29	251	436
45	Sauger.....	197	1298	10	145	178	1	33	49	0	164	25	123	312
46	Do.	207	1480	11	22	176	148	10	45	38	141	25	258	424
47	Bangalore...	211	3004	8	35	319	4	14	32	35	141	23	85	254
	Do.													
		Average..		88	932	75	23	26	48	36	104	30	187	312

APPENDIX U.

Form of the Annual Cash Estimate to be submitted by the District Engineer to the Inspecting Engineer.

STATEMENT OF THE PROBABLE AMOUNT REQUIRED FOR THE DISBURSEMENTS OF THE PUBLIC WORKS DEPARTMENT IN NORTH ARCOT IN THE OFFICIAL YEAR 1854-55.

Items.	Amount Sanctioned.	Expended up to February 1854.	Amount required for the expenditure of 1854-55.
ABSOLUTE.	Rs.	Rs.	Rs.
<i>Irrigation Works.</i>			
<i>New Works.</i>			
Restoration of the ancient tank of Bommasamoodrum, sanctioned by Government on the 10th January 1854.....	7,288	0	7,288
Excavation of a new Channel from the Ponnary River to the Sholingbur tank, sanctioned by Government on the 12th February 1854.....	9,985	3,000	6,985
Restoration of the ancient ruined tank of Pannamaringhy; sanctioned by Government on the 18th February 1854....	8,463	0	8,463
Total for new works.....			22,736
<i>Repairs.</i>			
Probable amount of the ordinary repairs of works of Irrigation; being the Annual amount fixed for that object in this District, by the order of Government of the 15th May 1853....	65,000	0	65,000
Total for Irrigation works.....			87,736
COMMUNICATIONS.			
<i>Roads and Bridges.</i>			
<i>New Works.</i>			
Formation of a road from Byreddipully by the Bootalagoontu pass to the Railway Station at Gooriantum 26 miles, sanctioned by Government on the 12th May 1853.....	51,267	15,500	25,000
Completing the road by the Damul Cherwoo Pass from the Onddapa frontier to the Railway Station at Minnel 45 miles, sanctioned by Government on the 28th Dec. 1852....	97,480	28,638	30,000
Construction of a Bridge over the Arnee River, sanctioned by Government on the 18th July 1853.....	4,678	0	4,678
Total for new works.....			59,678
<i>Repairs.</i>			
Amount placed Annually at the disposal of the Collector for the improvement of the District and cross roads, by the order of Government of the 12th June 1853.....	11,000	0	11,000
Sums allowed Annually for the maintenance of certain made roads in the District; under the orders of Government of the 8th June 1849, 10th February 1851, 28th May and 16th July 1852, and 12th November 1853.....	12,560	0	12,560
Total for repairs.....			23,560
Total for Roads.....			83,238

APPENDIX U. (Continued.)

Items.	Amount Sanctioned.	Expended up to February 1854.	Amount required for the expenditure of 1854-55.
BUILDINGS.	Rs.	Rs.	Rs.
<i>New Works.</i>			
<i>Civil.</i>			
Construction of a Talook Cutcherry at Chendragberry, sanctioned by Government on the 18th June 1853.....	1,547	0	1,547
Enlarging and improving the Collector's Cutcherry at Chittoor, sanctioned by Government on the 2d August 1853.....	2,412	0	2,412
Total of Civil Buildings.....			3,959
<i>Military.</i>			
Additions and Improvements to the Military Arsenal at Vellore, on Estimate sanctioned by Government on the 14th August 1853.....	1,254	0	1,254
For building the grand Magazine compound wall and guard rooms &c. within the Fort of Vellore on Estimate sanctioned by Government on 2d September 1853.....	855	0	855
For improving the Military Store room in Chittoor on Do. sanctioned by Do. on 5th January 1854.....	155	0	155
Total of Military Buildings.....			2,264
Total of New Works to Buildings.....			6,223
<i>Repairs.</i>			
Probable amount of ordinary repairs to Civil Buildings, being the average of the last three years.....			2,328
Do. Do. to Military Do. being the average expenditure of the last three years.....			1,286
Total repairs to Buildings.....			3,614
Total for Buildings.....			9,837
Total estimated expenditure on Irrigation Works, Roads, and Bridges.....			1,80,811
Purchase of tools, being the average of the preceding three years.....			2,360
Miscellaneous and Contingent charges, being the average of the same period.....			1,180
Total absolute.....			1,84,351
Contingent.			
Estimates submitted and about to be submitted.			
<i>Civil.</i>			
Constructing a Calingula to Cauverypauk tank, Estimate about to be submitted.....			2,000
Restoration of the tank at Manipaukum, Estimate submitted on 2d March 1854 but sanction not received.....			3,565
Carried forward.....			5,565

Items.	Amount Sanctioned.	Expended up to February 1854.	Amount required for the expenditure of 1854-55.
Brought forward.....			Rs. 5,565
Erecting a Travellers Bungalow at Kurumbady, Estimate sent on 18th February 1854 but sanction not yet received.....			1,754
Erection of a new Verandah to the Session Court house at Chittoor according to an estimate about to be submitted.....			238
Total of Civil Works.....			7,557
Military.			
Enlarging the hospital of the Dragoon Barracks at Arcot and constructing drains. Estimate ordered to be made on 12th February 1854, which is to be sent in as soon as possible.....			800
For building a guard and Prison room to the Barracks at Vellore according to an Estimate about to be submitted.....			296
For erecting a Guard room attached to the Granary at Arcot..			253
Total of Military Buildings.....			1,349
Probable amount of other works to be sanctioned and executed within the year.....			15,000
Total Contingent.....			23,906
Grand Total.....			2,08,257

NORTH ARCOT
District Engineer's Office,
Sholingur, April 5, 1854.

(Signed) C. D.
District Engineer.

APPENDIX V.

Form of the annual Abstract Cash Estimate to be submitted by the Inspecting Engineer to the Board of Works.

ANNUAL ABSTRACT ESTIMATE SHOWING THE PROBABLE AMOUNT REQUIRED FOR DISBURSEMENT IN THE 4TH DIVISION IN THE YEAR 1854-55.

Items.	North Arcot.	Chingleput.	Madras.	Total.
1	2	3	4	5
ABSOLUTE.				
Irrigation Works.				
New Works.....	22,736	21,655	1,050	45,441
Allowances granted to Collectors for Minor New Works and repairs.....	65,000	55,000	840	1,20,840
Total....	87,736	76,655	1,890	1,66,281
COMMUNICATIONS.				
Roads and Bridges.				
New Works.....	59,678	45,540	0	1,05,318
Allowance to Collectors for repairing and improving District cross roads.....	11,000	12,000	0	23,000
Allowance to Engineers for made roads.....	12,560	10,350	0	22,910
Total....	83,238	67,990	0	1,51,228
BUILDINGS.				
Civil.				
New Works.....	3,959	2,840	1,500	8,299
Repairs.....	2,328	2,109	350	4,787
Total....	6,287	4,949	1,850	13,086
Military.				
New Works.....	2,264	1,805	0	4,069
Repairs.....	1,286	800	0	2,086
Total....	3,550	2,605	0	6,155
Total....	9,837	7,554	1,850	19,241
Purchase of Tools and Implements.....	2,360	1,855	75	4,290
Miscellaneous Charges.....	1,180	1,275	50	2,505
Total Absolute....	1,84,351	1,55,329	3,865	3,43,545
CONTINGENT.				
Amount of Estimates for New Works submitted and about to be submitted.				
Civil.....	7,557	8,235	1,010	16,802
Military.....	1,349	845	0	2,194
Probable amount of other works to be sanctioned and executed within the year.....	15,000	12,000	650	27,650
Total Contingent....	23,906	21,080	1,660	46,646
Grand Total Absolute and Contingent....	2,08,257	1,76,409	5,525	3,90,191

[illegible]

Form of Abstract Memo. shewing the amount of Estimate and expenditure in previous years for comparison to be annexed to the Estimate in Appendix W, 1.

ABSTRACT MEMO. SHOWING THE AMOUNT OF ESTIMATE FOR 1854-55 REQUIRING SANCTION, AS WELL AS PREVIOUS YEARS ESTIMATE AND EXPENDITURE FOR COMPARISON.

Items.	Amount expended in 1852-53.	Amount of Estimate for 1853-54.	Amount expended up to February 1854.	Amount of Estimate for 1854-55 requiring sanction.
ABSOLUTE.				
<i>Irrigation Works.</i>				
New Works.....				
Allowance granted to Collectors for minor new works and repairs.....				
Total..				
COMMUNICATIONS.				
<i>Roads and Bridges.</i>				
New Works.....				
Allowance to Collectors for repairing and improving District cross roads.....				
Allowance to Engineers for made roads.....				
<i>Rail Roads.</i>				
New Works.....				
Repairs.....				
<i>Ferry Boats.</i>				
New Works.....				
Repairs.....				
<i>Canals.</i>				
New Works.....				
Repairs.....				
<i>River Navigation.</i>				
New Works.....				
Repairs.....				
Total..				

Items.	Amount expended in 1852-53.	Amount of Estimate for 1853-54.	Amount expended up to February 1854.	Amount of Estimate for 1854-55 requiring sanction.
<i>Buildings.</i>				
<i>Civil.</i>				
New Works.....				
Repairs.....				
<i>Military.</i>				
New Works.....				
Repairs.....				
Total..				
Stores of Public Works Department.....				
Miscellaneous Charges on account of Public Works...				
Total Absolute..				
<i>Contingent.</i>				
Amount of Estimates for new works submitted and about to be submitted				
Civil.....				
Military.....				
Probable amount of other works to be sanctioned and executed within the year.....				
Total Contingent..				
Grand Total Absolute and Contingent..				

Fort St. George,
Department of Public Works, }
20th April, 1855.

(Signed) A. B.
Secretary to the Board of Works.

APPENDIX X.

Form of Monthly Estimate to be sent by an Executive Agent to the District Engineer.
ESTIMATE OF THE AMOUNT REQUIRED FOR DISBURSEMENT ON ACCOUNT OF THE EXECUTION OF WORKS IN CHARGE OF SUB ENGINEER A. B. OF THE 1ST SECTION OF THE DISTRICT OF NORTH ARCOT, IN THE MONTH OF AUGUST 1854.

Talooks.	Items.	Sanctioned amount.	Amount expended up to 20th July 1854.	Amount required for disbursement in August 1854.	Total.
	<i>Irrigation Works.</i>				
	New works sanctioned by Government.				
Chittoor.....	Reconstruction of the Bommasamoodrum tank.	7,299	448	800	
Chendragherry..	Restoration of the ruined tank of Nagaputlah..	6,066	5,454	635	1,435
	Annual allowance for ordinary Repairs.				
Chittoor.....	New Calingulah to the Gunganairy tank.....	405	287	114	
Do.	Repairs to the Putnum large tank.....	659	220	200	
Do.	Repairs to the bank of Gunganairy tank....	326	182	144	
Do.	Excavating from the head of Sainumbutlah spring channel.....	100	47	53	
Do.	Repairs to Eroovarum tank.....	200	101	99	
Chendragherry..	Do. to the bank of Murrymauny spring channel.	60	35	25	635
	<i>Roads and Bridges.</i>				
	New works sanctioned by Government.				
Chittoor.....	Construction of a road from Bommasamoodrum to Chittoor.....	1,257	146	300	
Do.	For the improvement of the 2d class road No. 9 from the Western Trunk Road No. 1, at Vellore joining the Trunk Road No. 10, near Pannatoor.....	9,974	800	300	600
	Annual allowance granted to Collectors.				
Do.	Construction of a road from Chittoor to Aragoontah.....	1,000	728	300	300
	Annual allowance granted to Engineers for made roads.				
Do.	Ordinary repair of the made road from Chittoor to Moogly.....	800	300	180	180
	<i>Buildings.</i>				
	New works sanctioned by Government.				
	<i>Civil.</i>				
Chittoor.....	Improving the Collectors Cutcherry at Chittoor.	2,591	318	600	
Chendragherry..	Construction of a Talook Cutcherry at Chendragherry.....	1,547	100	510	1,110
	Carried forward.....				4,260

Talooks.	Items.	Sanctioned amount.	Amount expended up to 20th July 1854.	Amount required for disbursement in August 1854.	Total.
	Brought forward.....				4,360
	<i>Military.</i>				
Chittoor	For erecting a hospital and cookroom in the Fort of Chittoor.....	2,500	855	300	300
	Annual amount for repairs to Civil Buildings.				"
Chittoor	Repairing the Travellers' Bungalow at Veneatagherry	90	0	90	
Do.	Repairing the roof and floor of the Session Court House.....	187	56	131	221
	Annual amount for repairs to Military Buildings.				
Do.	Repairing the roof of the Sepoys' Hospital of the N. I., at Chittoor.....	78	0	78	
Do.	Repairing the Verandah in the quarters occupied by the Commanding Officer at Chittoor....	180	85	57	135
	Total Company's Rupees.....				4,916

Particulars of the amount required.	
On the Tahsildar of Chittoor.....	3,746
Do. of Chendragherry	1,170
	Rs. 4,916

Bommasamoodrum, 2
21st July 1854. 5

E. B.
(Signed) A. B.
*Sub Engineer of the 1st Section of the
District of North Arcot.*

APPENDIX

Form of monthly Abstract prepared by the District Engineer from the monthly Estimates of the Executive Agents for submission to the Inspecting Engineer.

By whom required.	Irrigation.		Roads and Bridges.			Buildings.				Purchase of Tools and Implements.	Miscellaneous charges on account of Public Works.	Total.	Remarks.
	New Works.	Allowance granted to the Collector for minor new works and repairs.	New Works.	Allowance to Collectors for repairing and improving district roads.	Allowance to Engineers for made roads.	Civil.		Military.					
						New works.	Repairs.		New works.					Repairs.
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Sub Engineer 1st Section.	1,435	635	600	300	180	1,110	221	300	135			4,916	
Overseer 2d Do.	1,309	555	635	250	150	930	135	309	125			4,490	
Sub Engineer 3d Do.	1,455	650	435	155	80	810	241	353	133			4,314	
Do 4th Do.	1,203	350	550	108	120	850	540	315	172			4,210	
Sub Overseer 5th Do.	555	300	180	105	110	450	123	245	50			2,118	
Overseer 6th Do.	1,050	325	255	158	112	605	120	225	115			2,965	
* Total.	7,000	2,815	2,655	1,076	752	4,775	1,380	1,740	730			22,923	
District Engineer.										150	50	200	
Grand Total.	7,000	2,815	2,655	1,076	752	4,775	1,380	1,740	730	150	50	23,123	

Particulars of the amount required in the undermentioned Taluoks.		
Sub Engineer 1st Section.	{ Chittoor..... 3,746	{ Cauveripak..... 2,850
	{ Chendragherry.... 1,170	{ Sholinghur.... 1,100
Overseer 2d Do.	{ Saignor..... 2,640	{ Sutraid..... 260
	{ Cuddapanattum... 1,300	
Sub Engineer 3d Do.	{ Trivellum..... 1,754	{ Arcot..... 1,750
	{ Vellore..... 2,560	{ Poloor..... 368
District Engineer	{ Do..... 2,760	{ Sub Overseer 5th Section.
	{ Do..... 4,514	{ Overseer 4th Section.... 2,850
		{ Sholinghur.... 1,100
		{ Sutraid..... 260
		{ Arcot..... 1,750
		{ Poloor..... 368
		{ Sub Overseer 6th Section.... 1,825
		{ Trivatoor..... 1,140
		{ Wandawash.... 2,965
		23,163

APPENDIX Z.

Form of letter of credit to be granted by the Inspecting Engineer to the Collector.

TO

THE COLLECTOR OF

NORTH ARCOT.

SIR,

With reference to the sanction of Government dated April 28th 1854 to the budget of expenditure on Public Works in North Arcot in the official year 1854-55, I have the honor to inform you that I have authorized the District Engineer to draw cash in the ensuing month of August to the amount of Rupees 23,163 and to request that you will cash his drafts drawn and presented within the month, to that amount.

I annex a Memo. of the Talooks in which the money will probably be required.

Chittoor.....	3,746	Sholingur.....	1,100
Chendragherry.....	1,170	Sutwaid.....	260
Sautghur.....	2,640	Arcot.....	1,750
Cuddapanattum.....	1,800	Poloor.....	368
Trivellum.....	1,754	Trivatoor.....	1,825
Vellore.....	2,760	Wandawash.....	1,140
Cauveripauk.....	2,850		
			Rupees.. 23,163

I have the honor to be

Sir,

Your most obedient servant,

(Signed) E. F.

Inspecting Engineer

4th Division.

CHINGLEPUT, }
29th July, 1854. }

APPENDIX A. A.

Form of ten days' report to be submitted by an Executive Agent to the District Engineer shewing the probable requirement of cash during the next ten days.

MEMO. OF CASH REQUIRED BY SUB ENGINEER A. B. OF THE 1ST SECTION OF NORTH ARCOT DISTRICT IN THE TEN DAYS FROM THE 21ST TO 31ST AUGUST 1854.

Items.	Amount.			Remarks.
	Rs.	A.	P.	
Balance in hand on 11th August 1854.....	175	3	2	
Amount of Cash received on two drafts No. 16 and 17 between the 11th and 20th August inclusive.....	530	0	0	
Total..	705	3	2	
Expended during the above period.....	684	9	3	
	20	9	11	
Amount required for disbursement during the ensuing 10 days.				
From the Tahsildar of Chittoor.....	700	0	0	
Do. of Chendragherry.....	370	0	0	
Total..	1,070	0	0	

Bommasamodrum, }
21st August 1854. }

E. E.

(Signed) A. B.

Sub Engineer of the 1st Section
of North Arcot.

Form of Register to be kept by the District Engineer showing the drafts and receipts drawn by him on the Tahsildars &c. on account of the Letter of credit.

REGISTER BOOK OF DRAFTS AND RECEIPTS DRAWN ON DIFFERENT TAHSILDARS &C. IN THE DISTRICT OF NORTH ARCOT ON ACCOUNT OF THE LETTER OF CREDIT OF THE INSPECTING ENGINEER.

No.	Date.	Talook.	In whose favor.	Amount.	Remarks.
On account of the Letter of Credit of the Inspecting Engineer No. 25 dated 29th July 1854, for Company's Rupees 22,383.					
1	1854 August 1st	Chittoor.....	Sub Engineer A. B.....	Rs. 700	A. P. 0 0
2	Do. 1st	Chendragherry....	Do.	800	0 0
3	Do. 1st	Santghur.....	Overseer G. F.....	680	0 0
4	Do. 1st	Cuddapanattum....	Do.	550	0 0
5	Do. 2d	Trivellum.....	Sub Engineer G. H.....	700	0 0
6	Do. 2d	Vellore.....	Do.	700	0 0
7	Do. 2d	Cauveripank.....	Overseer J. K.....	600	0 0
8	Do. 3d	Sholinghur.....	Do.	700	0 0
9	Do. 3d	Sutwaid.....	Do.	250	0 0
10	Do. 2d	Arcot.....	Sub Overseer L. M.....	700	0 0
11	Do. 3d	Poloor.....	Do.	350	0 0
12	Do. 4th	Trivatoor.....	Do. N. O.....	600	0 0
13	Do. 4th	Wandiwash.....	Do.	500	0 0
14	Do. 4th	Vellore.....	Do.	200	0 0
15	Do. 6th	Trivatoor.....	Sub Overseer N. O.....	700	0 0
16	Do. 6th	Arcot.....	Do. L. M.....	600	0 0
17	Do. 12th	Cauveripank.....	Overseer J. K.....	700	0 0
18	Do. 12th	Trivellum.....	Sub Engineer G. H.....	550	0 0
19	Do. 12th	Santghur.....	Overseer G. F.....	700	0 0
20	Do. 13th	Sholinghur.....	Do. J. K.....	350	0 0
21	Do. 14th	Cuddapanattum....	Do. G. F.....	650	0 0
22	Do. 14th	Do.	Do.	700	0 0
23	Do. 14th	Chittoor.....	Sub Engineer A. B.....	650	0 0
24	Do. 14th	Do.	Do.	700	0 0
25	Do. 15th	Vellore.....	Do. G. H.....	650	0 0
26	Do. 21st	Trivatoor.....	Sub Overseer N. O.....	500	0 0
27	Do. 22d	Wandiwash.....	Do.	550	0 0
28	Do. 22d	Cauveripank.....	Overseer J. K.....	700	0 0
29	Do. 23d	Chittoor.....	Sub Engineer A. B.....	700	0 0
30	Do. 23d	Chendragherry....	Do.	370	0 0
31	Do. 24th	Vellore.....	Do. G. H.....	700	0 0
32	Do. 25th	Arcot.....	Sub Overseer L. M.....	450	0 0
33	Do. 25th	Santghur.....	Overseer G. F.....	710	0 0
34	Do. 25th	Trivellum.....	Sub Engineer G. H.....	500	0 0
Total Company's Rupees				20,160	0 0

APPENDIX C.

Form of Monthly Progress Report of works in charge of the Foreman to be sent to an Executive Agent.

PROGRESS REPORT OF WORKS IN CHARGE OF THE FOREMAN RAMASAWMY NAIDOO IN THE TALOOK OF CHITTOOR IN THE DISTRICT OF NORTH ARCOT FOR AUGUST 1854.

No. and year of the Estimate.	Description of Work.	Estimated amount.	Date of Commencement of Work.	Amount expended.	Present state of extent of work executed up to the month.
2 of 1854-55	Repair of the Putnam large tank.....	659	1st June 1854.	Rs. 420	Rs. 3
38 of Do.	Ordinary Repair of the made road from Chittoor to Aragoorath.....	1,000	12th Do.	1,007	5 Finished 10th August 1854.
50 of Do.	Repairing the roof and floor of the Session Court House.....	187	18th July 1854.	210	The work to the roof is completed, greater portion of the flooring also is done.
5 of Do.	Repairing the roof of the Sepoys' Hospital of the N. I. at Chittoor.....	78	Do.	50	Completed on 13th August 1854.
58 of Do.	Repairing the Verandah in the quarters occupied by the Commanding Officer at Chittoor.....	180	30th July 1854.	150	Do. on 20th Do.

Chittoor }
1st September 1854.

(Signed) RAMASAWMY NAIDOO.
Foreman.

191

APPENDIX D. D. 1.

Form of Monthly Account Current of an Executive Agent in charge of a Section of a District to be sent to the District Engineer.

DR. ACCOUNT CURRENT OF MR. A. B. SUB ENGINEER IN CHARGE OF THE 1ST SECTION IN NORTH ARCOT FOR THE MONTH OF AUGUST 1854. Cr.

1854 Aug.	To amount of balance brought forward from the last month's account.....	17,798 9 8	By amount of expenditure on works for which bills were sent up to the District Engineer on different dates in August 1854.	13,886 11 3
3	To amount of draft No. 1 dated 1st August 1854 drawn on the Tahsildar of Chittoor.....	700 0 0	3 Bill No. 15 for the restoration of the ruined tank of Nagaputah.....	5,955 0 0
8	To do. of do. No. 2 dated 1st do. on the Tahsildar of Chendragherry.....	800 0 0	5 Bill No. 16 for constructing a new Calingalah to the Gungunary tank.....	336 4 3
20	To do. of do. No. 23 dated 14th August on the Tahsildar of Chittoor.....	650 0 0	8 Bill No. 17 for repairing Erooraram tank.....	201 1 2
24	To do. of do. No. 24 dated do. on the do. ..	700 0 0	12 Bill No. 18 for the construction of a road from Chittoor to Aragoontah.....	10,07 1 5
25	To do. of do. No. 29 dated 22nd August on the do.	700 0 0	13 Bill No. 19 for the ordinary repair of the made road from Chittoor to Moogly for the half year ending 30th April 1854.....	5,926 2 5
28	To do. of do. No. 30 dated 23rd August on the do. of Chendragherry	370 0 0	16 Bill No. 20 for repairing the roof of the Serpoy's Hospital of the Native Infantry at Chittoor	50 15 11
		3,920 0 0	28 Bill No. 21 for repairing the verandah in the quarters occupied by the Commanding Officer at Chittoor	150 2 1
			By balance.....	256 1 3
			Do. expended on works for which Bills have not been sent as per particulars given in the accompanying Statement.....	7,775 13 2
				8,031 14 5
		Total Company's Rupees.....	Total Company's Rupees.....	21,718 9 8

APPENDIX D. D. 2.

Form of Monthly Statement showing the particulars of charges incurred on the several works in progress to accompany the Monthly Account Current of the Executive Agent.

STATEMENT SHEWING THE PARTICULARS OF CHARGES INCURRED ON SEVERAL WORKS IN CHARGE OF SUB ENGINEER A. B. UP TO THE MONTH OF AUGUST 1854.

Description.	No. of Estimates.	Particulars of the works.	Expenditure for which Bills have not been sent.					Bills sent to the District Engineer.		Remarks.
			Up to 31st July 1854.	In August 1854.	Total.	Amount.	When sent.	Amount.	When sent.	
1	2	3	4	5	6	7	8	9		
New Works....	33 of 1853-54	Reconstruction of Bonmasamocdrum tank.....	455 2 11	307 0 6	762 3 5	0 0 0				
	17 of 1854-55	Restoration of the ruined tank of Nagaputah.....	5,501 15 11	453 0 1	5,955 0 0	5,955 0 0	Aug. 3			
	18 of 1854-55	New Calingalah to the Gungunary tank.....	5,957 2 10	760 0 7	6,717 2 5	5,955 0 0				
	20 of 1854-55	Repair of Patnam large tank.....	300 1 8	100 6 0	400 7 8	396 4 3	Aug. 3			5 The difference Rs. 5-3-5 recovered and credited in the accounts.
	21 of 1854-55	Repairing the bank of Gungunary tank.....	350 0 0	70 2 3	420 2 3	0 0 0				
Minor new works and repairs sanctioned by the Collector.	22 of 1854-55	Excavating from the head of Samun-butah Spring Channel.....	165 8 9	94 13 7	260 6 4	0 0 0				
	23 of 1854-55	Repairing Erooraram tank.....	55 2 8	5 2 11	60 5 7	0 0 0				
	24 of 1854-55	Excavating from the head of Samun-butah Spring Channel.....	101 6 5	99 10 9	201 1 2	301 1 2	Aug. 8			
	25 of 1854-55	Excavating from the head of Samun-butah Spring Channel.....	38 0 0	32 1 2	70 1 2	0 0 0				
	26 of 1854-55	Excavating from the head of Samun-butah Spring Channel.....	1,040 3 6	402 4 8	1,442 8 2	597 5 5				
New Works....	27 of 1854-55	Construction of a road from Bonmasamocdrum to Chittoor.....	150 2 6	295 3 6	445 5 11	0 0 0				
	28 of 1854-55	Construction of the 2nd Class Road from the Western Trunk Road No. 1 at Vellere joining the Trunk Road No. 10 near Pandur.....	895 6 0	779 2 2	1,674 8 2	0 0 0				
	29 of 1854-55	Construction of a road from Bonmasamocdrum to Chittoor.....	1,045 8 5	1,074 5 8	2,119 14 1	0 0 0				
	30 of 1854-55	Construction of a road from Bonmasamocdrum to Chittoor.....								
	31 of 1854-55	Construction of a road from Bonmasamocdrum to Chittoor.....								

	1	2	3	4	5	6	7	8	9
Roads & Bridges.	Minor new works & repairs sanctioned by the Collector. Do. do. by the Engineer.	36 of 1854-55 Construction of a road from Chittoor to Aragoatnah.		730 0 0	277 1 5	1,007 1 5	1,007 1 5	5 Aug. 12	
		16 of 1854-55 Ordinary repair of the made road from Chittoor to Moogly.		7,450 3 10	204 13 10	7,655 1 8	5,926 1 5	5 Aug. 13	Bill for the half year ending 30th April 1854.
			Civil.						
		40 of 1854-55 Improving the Collector's Cutcherry at Chittoor.		350 2 9	134 14 2	485 0 11	0 0 0		
		16 of 1854-55 Construction of a Telook Cutcherry at Chendragherry.		100 6 9	307 15 8	403 6 5	0 0 0		
				450 9 6	442 13 10	893 7 4	0 0 0		
			Military.						
		41 of 1854-55 Erecting a Hospital and Cookroom in the Fort of Chittoor.		901 6 5	253 12 6	1,155 2 11	0 0 0		
			Civil.						
		48 of 1854-55 Repairing the Travellers' Bungalow at Vencatagherry.		0 0 0	90 0 0	90 0 0	0 0 0		
		5 of 1854-55 Repairing the Roof and Floor of the Session Court House.		60 1 8	127 1 2	187 2 10	0 0 0		
				60 1 8	217 1 2	277 2 10	0 0 0		
			Military.						
		5 of 1854-55 Repairing the Roof of the N. I. Hospital at Chittoor.		0 0 0	50 15 11	50 15 11	50 15 11	Aug. 16	
		58 of 1854-55 Repairing the Verandah in the quarters occupied by the Commanding Officer at Chittoor.		92 2 2	56 15 11	150 2 1	150 2 1	Do. 28	
				93 2 2	107 15 10	201 2 0	210 2 0		
				17,723 6 4	3,739 5 6	21,467 11 10	13,886 11 3		
			Grand Total...						

APPENDIX E. E.

Form of monthly Abstract Statement of actual charges, to be prepared by the District Engineer from the Statement of charges received from the Executive Agent transmitted to the Inspecting Engineer.

STATEMENT OF CHARGE, INCURRED ON ACCOUNT OF PUBLIC WORKS IN THE DISTRICT OF NORTH ARCOT DURING THE MONTH OF AUGUST 1854.

Items.	Irrigation Works.			Roads and Bridges.			Buildings.				Purchase of Tools and Implements.		Miscellaneous charges.		Grand Total.	
	New works.	Allowances granted to Collectors for new works and repairs.	Total.	New works.	Allowance to Collectors for repairing and improving District cross roads.	Allowance to Engineer for made roads.	Civil.	Military.	Total.							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Sub Engineer Ist Section.	Rs. A.P.															
Overseer 2d do.																
Sub Engr. 3d do.																
do 4th do.																
Sub Over. 5th do.																
Overseer 6th do.																
Total.																
District Engineer.																
Grand Total.																

APPEN

Form of the Monthly Account Current of the District

Dr.

ACCOUNT CURRENT OF THE DISTRICT ENGINEER OF

To amount of balance brought forward from the last month's account..... 16,752 11 0

To amount of my drafts &c. drawn on the several Tahsildars &c. in favor of the undermentioned Subordinates as per Collector's account forwarded herewith.

Sub Engineer of the 1st Section..... 3,920 0 0
 Overseer of 2d Do. 3,990 0 0
 Sub Engineer of 3d Do. 5,800 0 0
 Overseer of 4th Do. 1,300 0 0
 Sub Overseer of 5th Do. 2,100 0 0
 Do. of 6th Do. 2,850 0 0

19,960 0 0

To amount of my receipt..... 200 0 0

20,160 0 0

Total Company's Rupees... 36,912 11 0

a difference dates in August 1854.

the restoration of the ruined tank of

Magaputla..... 5,955 0 0
 8 Bill No. 36 for constructing a new Calingulah to the
 Maganairy tank..... 396 4 3
 17 Bill No. 37 for the ordinary repair of the made road
 from Chittoor to Moogly for the half year ending
 30th April 1854..... 5,926 2 5
 20 Bill No. 38 for repairing the roof of Native Infantry
 Hospital at Chittoor 50 15 11
 21 Bill No. 39 for repairing the Sub Collector's Bunga-
 low at Arcot..... 2,735 9 3
 31 Bill No. 7 for the purchase of tools..... 101 9 8
 „ Bill No. 8 for Miscellaneous charges..... 34 8 7

15,200 2 1

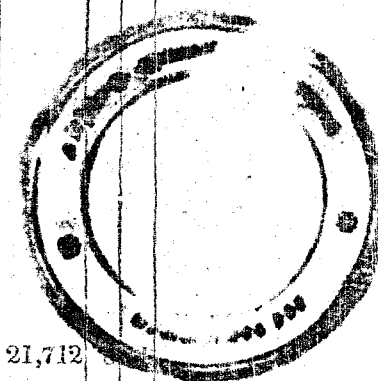
By Balance.

Amount of cash with the District Engineer..... 120 8 1
 Do. do. with the Sub Engineer &c..... 1,536 7 8
 Do. expended on works under execution..... 14,023 5 8
 Do. of bills received from the Overseers and under
 examination..... 6,032 3 6

21,712

Total Company's Rupees... 36,912 11 0

194



1	2	No.	3	4	
Brought forward.					
Chittoor.	Re-construction of the Bommasamoodram tank.....	33 of 1853-54	Government.	10th Jan. 1851	7,288
do.	Enlarging and improving the Collector's Cutcherry at Chittoor.....	156 of 1852-53	do.	2nd Aug. 1853	2,412
1854-55.					
Chittoor.	Repair of the Putnam large Tank.....	2	Collector.	22d May 1854	659
do.	Re-construction of the Talumbaid Tank.....	1	Government.	4th June 1854	3,292
do.	Construction of a road from Chittoor to Aragoentah..	3	do.	30th May 1854	1,257
do.	Repairing the roof of the Native Infantry Hospital at Chittoor.....	5	Supg. Engr.	15th July 1854	78
do.	Improving the Sub Judge's Court at Chittoor.....	4	Government.	2nd Aug. 1854	2,591
Chendragherry.	Strengthening the bank of Theokvayakum Tank.....	9	Collector.	2nd Sept. 1854	57
Chittoor.	Erecting a Verandah to the Court House at Chittoor..	8	Government.	17th Sep. 1854	557
Chendragherry.	Construction of a Talook Cutcherry at Chendragherry.	16	do.	26th Nov 1854	1,547
Chittoor.	Construction of a Bridge over Chittoor river.....	67	do.	28th Nov 1854	4,365
do.	Repairing the Athecary Tank	69	Collector.	30th Nov 1854	365

ed tion	Word	Whe	Amou incc clos end	Amount	When the Engine	Remarks
7	8	9	10	11	12	13
last year's Register.						
25th Jan. 1854	3rd Feb. 1854	10th Jan. 1855	1286	4 10	6,167	4 5 2nd Feb. 1855
16th Aug. 1853	28th Aug. 1853	26th Dec. 1854	987	14 10	1,410	11 5 3rd Jan. 1855
31st May 1854	5th June 1854	2nd Aug. 1854	0	0 0	636	2 1 8th Aug. 1854
14th June 1854	17th June 1854		0	0 0	2,357	4 3 5th May 1855
7th June 1854	8th June 1854	5th Aug. 1854	0	0 0	1,007	1 5 12th Aug. 1854
19th July 1854	20th July 1854	30 July 1854	0	0 0	50 15	11 16th Aug. 1854
5th Aug. 1854	12th Aug 1854	2nd Feby. 1855	0	0 0	2,436	2 7 9th Feb. 1855
13th Sep. 1854	15th Sep 1854	4th Oct. 1854	0	0 0	55	2 1 5th Oct. 1854
25th Sep. 1854	27th Sep 1854	2d Nov. 1854	0	0 0	546	4 2 5th Nov. 1854
6th Dec. 1854	12th Dec 1854	16th Apl. 1854	0	0 0	1,467	8 3 23d Apl. 1855
8th Dec. 1854	10th Dec 1854		0	0 0	3,769	4 3 4th May 1855
9th Dec. 1854	15th Dec 1854	23d Mar. 1855	0	0 0	376	4 5 27th Mar. 1855

195

		3	Brought		
Satgar.....	Formation of a road from Byreddipully by the Boottala Goontah pass to the railway station at Gooriatum 23 miles.....	10 of 1853-54	12th May 1853	Government.	22d June 1853 51
Chaveripauk...	Constructing a Caligala at Goonoomaday in the bank of the Chaveripauk channel.	25 of 1853-54	11th Aug. 1853	Do.	14th Sept. 1853 3,684
Vellore.....	Repairing the Travellers' Bungalow at Vellore.	30 of 1853-54	30th Sept. 1853	Insp'tg. Engr.	15th Oct. 1853 476
1854-55					
Chittoor.....	Re-construction of the Taulumbaid Tank..	1	3d May 1854	Government.	4th June 3,292
Do.	Repair of the Putnum large Tank.....	2	15th do.	Collector.	22d May. 659
Do.	Construction of a road from Chittoor to Aragoontah.....	3	15th do.	Collector.	30th May. 1,257
Do.	Improving the Sub-Judges' Court at Chittoor.....	4	25th June. do.	Government.	2nd August. 2,591
Do.	Repairing the roof of Native Infantry Hospital at Chittoor....	5	6th July. do.	Insp'tg. Engr.	15th July. 78
Chaveripauk....	Construction of a large Sluice to Chaveripauk Tank.....	6	do.	Collector.	10th do. 415
Vellore.....	Constructing a Travellers' Bungalow at Ranepet.....	7	8th Aug. do.	Government.	17th September. 2,569
Chittoor.....	Erecting a Verandah to the Court house at Chittoor.....	8	19th do.	Do.	17th do. 557
Chendragherry.	Strengthening the bank of Thookevakum Tank.....	9	2nd Sept. do.	Collector.	9th do. 57
Vellore.....	Repairing the Quarters occupied by the Commanding Officer at Vellore.....	10	2nd do.	Insp'tg. Engr.	15th do. 256

W.	expenditure on the Current year.	Am pleir of	0	11	12	13	14
7	8	9					
Register.							
20th May 1853	25,000	15,009	6	11	6th May 1854 29	18,960	5 8 18th May 1854
9th Aug. 1853	2,538	2	6	23d June 1854 34	3,599	15 11	28th June 1854
15th Oct. 1853	159	3	0	15th May 1854 31	479	5 6	20th May 1854
9th May 1854	3,292	0	0	0 12th May 1855 72	2,651	9	20th May 1855
21st do. "	659	0	0	0 13th Sep. 1854 40	636	2	16th Sept. 1854
30th June "	1,257	0	0	0 23rd Nov. 1854 54	1,097	1	5 25th Nov. "
30th do. "	2,591	0	0	0 5th April 1855 65	2,436	2	7 9th April 1855
11th July "	78	0	0	0 23rd Aug. 1854 38	50	15 11	29th Aug. 1854
11th do. "	415	0	0	0 8th Nov. 1854 48	656	3	0 10th Nov. "
15th Aug. "	2,569	0	0	0 28th April 1855 68	2,593	2	14th May 1855
15th do. "	557	0	0	0 12th Nov. 1854 57	546	4	2 15th Nov. 1854
10th Sept. "	57	0	0	0 13th Oct. 1854 45	55	2	1 15th Oct. "
11th do. "	256	0	0	0 12th Nov. 1854 52	257	8	0 16th Nov. "

196

APPENDIX

Prepared from the

ABSTRACT OF ESTIMATES OF THE DISTRICT OF NORTH ARCOT ARRANGED UNDER DIFFERENT MD

FROM THE REGISTER

[illegible]