

(1) Number of pages 1(2) Date of repair 12-1-37(3) Initials of the Referencer CA**MADRAS RECORD OFFICE.****Government of Madras.***Public Works* **DEPARTMENT.**

|          |     |        |
|----------|-----|--------|
| G.O. No. | 703 | Press  |
|          |     | Mis.   |
| 18-19    |     |        |
| Dated    | 2 5 | 18 60. |

**Not to be folded or roughly handled***JP*

*Proceedings of the Madras Government, Public Works Department,  
for the month of May 1860.*

No. 18. Read the following letter from Captain C. H. DICKENS, Officiating Secretary to the Government of India, to J. D. BOURDILLON, Esq., Secretary to the Government of Madras, dated Fort William, 31st March 1860, No. 1,663 :—

With reference to your letter No. 2,261, dated 20th September 1859, I am directed to forward for the information of the Honorable the Governor of Madras in Council, the accompanying copy\* of a printed Memorandum of the result of the discussion with Captain Chambers on the Madras system of Public Works Accounts, and to request that the Government of India may be furnished with a copy of any report Captain Chambers may have made on the subject.

2. I am to draw the special attention of the Government of Madras to the subject of Stock and Work Accounts, and to state that the Government of India are satisfied that the defects of the Madras system are being discussed and satisfactorily disposed of by the Officers of that Presidency; and do not wish to insist upon any further change beyond what is necessary to secure the correct preparation of the Returns and Accounts (including Stock Accounts) required in the Classification Report.

3. The Government of India will be prepared to receive with favor any suitable proposal for the Establishment of a separate Office of Audit and Account for the Public Works Department in Madras.

MEMORANDUM ON THE MADRAS SYSTEM OF PUBLIC WORKS ACCOUNTS.

Captain Chambers arrived by the Steamer of 16th November 1859, and reported himself at this Office next day. He afterwards visited the Bengal Office of Account several times, and had long consultations with me, saw all that was doing, took away from time to time papers of all descriptions, and studied them in his own quarters, and finally, having made himself fully acquainted with our system, left on the Steamer of 23rd December 1859.

— Captain Chambers will make his report to his own Government. So I only need say here that he expressed himself pleased with what he saw; and that he took away forms of all kinds for the information of the authorities at Madras.

3 During our consultations I obtained from Captain Chambers some of the regulations and forms of the Madras Public Works Department, and gained a general knowledge of the system of accounts in force there.

4 The Madras Public Works Department is for the most part arranged by Districts: in each of which is a District Engineer as the local head of the Department. Each District is divided according to extent and the importance of the works into a certain number of Executive Ranges (four or five on the average); and in each range an Assistant Engineer or Subordinate Officer of some grade, holds charge, being called in general terms the Executive Officer or Agent. These again have subordinates under them, who render the detailed accounts of works. When the works are finished, or after the year's end if the work is not finished within the year, the Executive Officer or Agent prepares bills, sending them up with the detailed accounts to the District Engineer, who checks the bills, countersigns them, and sends them up for Audit to the Chief Engineer, without the detailed accounts.

5 The District Engineer also sends up to the Chief Engineer a Monthly General Account Current in which he takes credit for the expenditure, the bills due and submitted being shown in a separate Abstract attached, and which is in fact an account of Inefficient Balance standing against the Division for want of bills. The District Engineer also submits to the Chief Engineer Monthly Progress Reports showing the total expenditure on each work, and the expenditure during the month, which report corresponds with the Account Current, and is compiled from similar but more detailed reports from his Executive Officers and Agents. These Progress Reports however do not show the cost of different kinds of workmanship done.

6 In Bengal the Public Works Establishment is arranged by Divisions. The Divisions have no reference at all to the Civil Districts, but are fixed on considerations of convenience as to what works and what extent of country shall be under each Executive Engineer. The Divisions are again divided into subordinate charges or sub-divisions, of which the number varies greatly, the average being about nine. The Bengal Divisions have generally less extent of country and less expenditure than the Madras Districts, but are larger than the Executive Ranges. Perhaps to give a general rough idea of the relative importance of these charges it may be said that a Madras District is about equal to two Bengal Divisions, and the latter equal to two Madras Ranges; the Madras Range being equal to five Bengal Sub-Divisions. In particular cases however there are wide differences from the average. A District Engineer in Madras may be

said to hold a charge intermediate between the Superintending Engineer and Executive Engineer of Bengal.

7 In Bengal the detailed accounts of the works are sent by the Subordinates in charge of Sub-Divisions to the Executive Engineer, who after examination passes them on to the Central Office of Account. There they are checked in detail and abstracted, so as to form a kind of monthly bill embracing the whole expenditure of the Division, and showing in detail a comparison of the work done with the estimates in each case, with the quantities, cost, and rates of each sort of workmanship executed under each estimate. These abstracts are audited by the Superintending and Chief Engineer, a copy having been sent to the Executive Engineer for his information. The latter Officer is allowed credit for the amount passed on audit, and the abstract is ledgered in the Central Office so as to bring the whole of the cash, work and store operations embraced in it under their proper heads. Besides the detailed accounts of his subordinates the Executive Engineer sends up a monthly general Account Current of his receipts and expenditure, in which he takes credit for the amount of the Abstracts passed.

8 In order to describe in general terms, the difference in principle between the Bengal and Madras systems of Accounts, I must premise that Public Works Accounts on the former system consist of three branches—

- I. Cash Accounts.
- II. Store Accounts.
- III. Work Accounts.

9 Cash expenditure takes place either directly to the works in the form of payments for labour or contract payments, or indirectly in the purchase or manufacture of stores which are either expended at some future time in the construction of works, or, as in the case of tools, are gradually worn out after having been used more or less on several works. To test the propriety of the expenditure both of cash and stores, and to keep a proper record of it in the accounts, it is necessary to have an account of the work done as an accompaniment to the accounts of the cash and stores expended.

10 The process followed then is that all that is expended of the cash—that is all the credits to cash—are carried into the accounts of stores or of works, that is, are debited to stores or works. Then again all that is expended of the stores is carried to the account of the works on which it is used; or the store account is credited and the works debited with the stock expended. Lastly, when the work is finished a bill is prepared by which the work account is relieved and the charge made to Government.

11 This is a general sketch. Of course the matter requires many special arrangements to suit peculiar cases; but the view I have given, seems to me to be enough for the present purpose.

12 Now to return to the Madras system, I think it is truly but briefly described by saying that they keep cash accounts, but they do not keep accounts of stores or works, except in a very partial and superficial way.

13 In the cash accounts the Madras system agrees with that of Bengal in all the most essential points of detail. They have, moreover, a very great advantage over Bengal in the nature of the Revenue system which covers the country with small Tuhseeldaree Treasuries, and affords the Executive Engineers the means of reducing their cash transactions, and adopting banking with these Treasuries to an extent which must greatly relieve themselves and benefit Government by reducing the cash balances required to be kept in hand.

14 The only improvements I can suggest in the cash accounts are the abolition of the numerous separate bills of works, and the making the monthly Progress Report a bill. This change requires a very small modification of the Progress Report. It would relieve the District Engineers of all the labour of preparing the bills, and would, I am sure, be much simpler to the Government Accountant than the present system. To prove which I need only say that Captain Chambers himself would have to send in about 600 bills for the year 1858-59 for his own District in addition to twelve monthly Progress Reports. I would relieve him entirely of the former and slightly modify the latter.

15 It would be proper to have bills for the larger works and for the aggregate expenditure on various classes of smaller ones; but the preparation of these might be left to the Central Office spoken of further on.

16 I have next to advert to the store accounts. Here I think the Madras system very seriously defective. The plan is to charge all expenditure for stores direct to the works, except in the case of stores from England or from the Ordnance Department. These latter are kept in an open account and are correctly charged off as used on the works, or, what we should term incorrectly charged to the works by degrees when not actually used.

17 Now the effect of this system is that the stores are liable to be lost sight of altogether. They disappear from the accounts directly they are purchased. There is nothing to show how they are disposed of afterwards, and, for all that the accounts show to the contrary, they might

be carried away and expended on any body's private work. This, as I have said is a most serious defect.

18 It is quite true that the whole working of the Department is under the control of the Officers of the Madras Engineers and other Officers of the Service whose character is a sufficient guarantee that all the operations will be honestly and zealously watched, and all attempts at peculation checked by their careful and frequent inspections. But it is really impossible for any person to check complicated operations of this kind without accounts; and it is therefore certain that accounts of stores are necessary in the Madras Public Works Department for the protection of the Government interests.

19 But besides the liability to abuses arising from want of accounts, it is objectionable that the public accounts should not show all the property of the State. Under the system in force tools and machinery to a large value are charged off to the works and utterly disappear from the accounts of the public property, though they remain in existence in full working order. Some Officers have large and valuable workshops which should in the public accounts be represented by so much capital invested and being worked, but they are required to render no account whatever of their operations, and the Accountant General of the Madras Government has no official knowledge of the existence of these workshops. All the important parts of these factories have long ago been charged to the works and have disappeared from the public accounts.

20 The case is the same with all the stock of machinery, tools, and a portion of the materials on hand throughout the whole Presidency, except the portion which, having lately been received from England or from the Ordnance, has not been so charged; or which having been paid for in cash, but not charged off, stands in the accounts under the indefinite head of Advances.

21 The charges for work done show in detail, in the first instance, the number and amount of wages of workmen of all sorts who have been employed, and the quantity and cost of materials of all kinds purchased. But the nature and quantity of the work performed by the former, or the nature and quantity of work upon which the latter have been used is not shown, except in a few cases of contract or task work. It is impossible, therefore, to say whether on the whole the charge is moderate or otherwise, and the accounts therefore afford no check on the operations of the Department, except in the very general and superficial way of comparison of the amount expended with the amount sanctioned. Even when the work is finished, quantity of each kind of workmanship done is not (or rather till very lately was not) reported or in any way mentioned in the bill, so that it was impossible even then to tell by the bill whether the charge is excessive or moderate, except by comparison in the gross with the estimate; and this check in the case of large works cannot be applied till the end of many months or years.

22 Here again the Madras system professes to gain the object without cumbering the accounts with details, by trusting to inspections of the work. Personal inspection by the superior Officer is, no doubt, a very necessary thing, and no accounts will be sufficient to check the expenditure on work without it. But then no man can carry in his head all the details of large and complicated works; and unless he is furnished with a statement of work done for comparison, or prepares one himself during his inspection, the main part of the advantage of the inspection, considered as a check, is lost. If such a statement is prepared (as it is ordered to be) a copy of it should accompany the accounts, and the accounts should be framed to show the details of charges for comparison with it. A mere certificate of the quantity of work done without rates being struck is, however, of no immediate use in checking expenditure. The Engineer must calculate the rates in order to make use of it.

23 This part of the question, so far as relates to the bills showing the quantity, and rate of cost of work done, and to there being inspections and valuations of work, has been taken up by Colonel Bell, the Chief Engineer of Madras, and he has wisely advised the Government to make a beginning of reform by showing these particulars to some extent in the case of all works exceeding Rupees 2,000 each in cost. (Madras Proceedings, Nos. 42-6, dated 26th September 1859.)

24 But it is not enough to know the quantity of each sort of work done when the building is completed. This information should regularly form part of the accounts in every stage. If not, none of the persons whose business it is to check the expenditure can have any idea how far they succeed in keeping the cost down to its proper limit. And for the purpose of proving and punishing fraud, accounts containing this information would be very superior. In every stage there would be the appropriate fact recorded in the accounts themselves. So much money spent in purchasing such and such material and performing such and such work, and so much money still in hand; so much of the materials also spent on such and such work and so much still in hand. The cost of the labour and materials in the market is known: The cost of such kinds of work is within certain limits known. So that no man would charge rates greatly in excess without being certainly detected; which leads to conviction of bad management, at least. Then again the quantity of work charged for admits of test by inspection and measurement, and so do the quantities of cash and stores in hand. Here then the accounts profess to record the facts, and if the facts are found different, there is at once a proof of rendering false accounts.

25 But in the Madras system, the quantity of work done does not enter at all into the accounts (except in cases of task work or contract). And they thus lose one main element in the detection of fraud or bad management.

26 In fact, so loosely do the accounts refer to the work done, that it would often be impossible to tell from a bill or account (supposing a mere change of a word possible in the heading) whether the thing constructed was a bridge or a house. Again in bills for the repair of roads there is shown the number and cost of the labourers employed, and the quantity of gravel purchased or quarried. But there is nothing to show whether the gravel has ever been applied to the purpose intended, of metalling the road, or not. This sort of bill is a most unsatisfactory document to pass; for the object of the expenditure is to have the work done, and the bill does not show whether it has been done or not!

27 Independently of the advantages of stock accounts in themselves as above stated, they are necessary if the expenditure is to be compared with the progress made in the work. For instance, when a house is to be built the first operation is to collect a certain quantity of materials,—in the first place probably bricks and lime. The work to be done is so much brick-work and floors, &c. Now if the bricks first collected were to be charged to the walls before the walls were begun, there would of course be no proportion between the cost and the quantity of work done; and when at a later stage a small portion of wall had been built, there would be a quantity of bricks charged to it out of all proportion to the work done. Any attempt, therefore, to strike rates for comparison of the work done with the expenditure would of course fail on such a system. To obviate this the Bengal system provides stock ledgers, which contain heads for tools, petty stores, timber, bricks, lime, fuel, and other classes of stores as detailed in the Code. When bricks are purchased or manufactured, the charge is passed to the head "Bricks" in the Stock Ledger. When some of the bricks have been used on the work during the month the head "Bricks" in the Ledger gets credit, and the charge is made to the works; and so of other materials. In this way the charges to the works always bear a proper proportion to the work done, if the work is properly supervised. The accounts thus become a true guide to the supervising Officer in testing the expenditure throughout the whole progress of the work, whenever it is of such a nature as to be accurately tested in this way. In some cases, as in wood-work, this cannot be done so perfectly as in brick-work, because the material is made over rates may be struck to some extent as the work goes on.

28 To return to the stock accounts. It is evident that in the case of any extensive work the bricks will often vary in price. Purchases will be made at different times at different rates. One kiln will turn out well and the bricks will be cheap, another will turn out badly and the few bricks obtained will, of course, be dear. If we were to alter the price of bricks charged to the works for each variation of this kind, the comparison of the cost to the quantity of work would not hold absolutely good, though the variations would not generally be so great as to affect its usefulness. Again, supposing a great number of separate works to be going on within a moderate distance, an Engineer will generally have only one kiln yard and from it will issue bricks to all the works. Some works will be close by, some will be at a considerable distance. If the cost of carriage be charged to the works there will be a different rate of brick-work at each, and no comparison can be made of the rates of one work with another. To obviate this difficulty the practice here is to charge the carriage to the bricks, and charge the bricks to the several works at an uniform rate to cover all charges.

29 Lastly, when bricks are manufactured on a large scale, a great deal of expense has to be gone to in obtaining and preparing ground, in building kilns, moulding bricks, &c., before a single brick is burnt; and directly a kiln of bricks is ready it has to be made use of. All the preliminary and general charges cannot be borne by this first kiln. It is therefore necessary to assume a rate for the bricks at which to charge them to the works, and to modify this rate afterwards, if necessary, according as the account shows a profit or a loss. The assumption of a rate at first is not mere guess work. In this Presidency it is found as a general rule that there is one rate which assumed for a whole Executive Engineer's charge, will on the average represent with sufficient accuracy the cost of bricks in his Division. It requires to be slightly raised or lowered at times; but on the whole it does not vary except under peculiar and traceable circumstances throughout the whole Division. It has been found in fact experimentally that we can generally work with average rates.

30 This system of average rates is usually strongly objected to as a fictitious system of charges. But experience will show that it is not so. It is the only real and natural way of charging materials to works.

31 It is of course not to be applied indiscriminately. If there are any plain causes why materials will always be dearer at one place than at another, it would be wrong to charge both alike to the works. But, as a general rule, we do not find this.

32 However, this does not affect the system. It is equally workable with several rates according to actual cost of manufacture at each locality, as with one uniform rate for the whole Division. The essential point is that the Engineer shall have these heads of account as a guide,

so that he may not on the whole charge too much or too little, while, on the other hand, he is free to charge a reasonable proportion of the cost of the materials to his works at all stages. I have taken bricks as an example. Of course the principle is applicable to all other materials.

33 It may be remarked here that the Stock Ledger must not have too many heads. If it is attempted to keep a Dr. and Cr. Account for each article of stock, the result must be failure, from the complication of accounts. What is wanted is a practical guide on the whole. Absolute precision in detail of the cost of each article is unnecessary and impracticable.

34 When it is recollected what a vast variety of materials and kinds of work Engineers have to deal with, it will be admitted at once the Engineer's accounts must be very complicated, and very difficult to manage well, even on the best system. Officers who may be excellent Engineers often find the accounts a very heavy tax on their time, and a heavy addition to their responsibilities; while others leave the work to their Clerks and Accountants, as something which they cannot be expected to look into.

35 This view of the matter was strongly brought forward by the Bengal Public Works Committee of 1851, and the result was the Central Office system by which the Engineer and his subordinates had merely to send up the exact facts of the expenditure, with simple cash accounts current, which were to be abstracted, the cost of materials entered, and all properly ledgered in the Central Office, and the result furnished monthly to the Engineer for his information. The Engineer would thus be relieved of the trouble and anxiety as to his accounts, and would be left free to attend to his own proper business in designing and supervising work.

36 This system succeeded perfectly in the Canal Department of the North West Provinces under the supervision of its inventor, Mr. Marten; but having been ordered to be introduced in other Chief Engineer'ships, before proper instructions were prepared and properly qualified Accountants provided, things fell into the confusion from which they are only now emerging.

37 It is evident, therefore, that to attempt any sudden change of the Madras system would be most unadvisable and dangerous. Captain Chambers has seen the Central Office, and knows the advantage of the ledgering as a means of obtaining information and giving the Chief Engineer a control over the Department. It may well be left to the Madras authorities to introduce such parts of the system as can be introduced at once without fear of failure; and the rest will follow by degrees as the want of it is felt.

38 It must not be supposed, however, that in Madras they get on without the difficulties and confusion we have had here. The Engineers there have workshops and sell materials to the works just as we do in our stock ledgers. Only the transactions do not appear in the public accounts, and the confusion remains known only to those who have charge of the establishments, from which they render no official accounts at all. I have no doubt that some of these establishments will be found admirably managed, but it is not to be supposed that there are no failures in this respect, because there are no accounts submitted to bring defects to light. It will also in all probability be found that there are systems of stock accounts in some of the Districts, which the Officers keep for their own convenience, though not ordered to do so; and that in some cases there is good management, and in others, much confusion.

C. H. DICKENS, Capt.,

Offg. Secy. to Govt. of India, P. W. D.,  
And late in charge, Bengal Central Office of Account,  
P. W. Dept.

CALCUTTA,  
1st Feby. 1860.

No. 19.

ORDER THEREON, 2nd May 1860, No. 903.

Ordered that this letter and its enclosure be forwarded to the Chief Engineer for any observations that he may have to offer. Pending the receipt of a reply to this reference, the Government will defer passing orders on the Chief Engineer's letter of the 21st February last No. 10,507.

(Signed) J. D. BOURDILLON,  
Secretary to Government.

7✓

# MEMORANDUM

ON THE

MADRAS SYSTEM

OF

PUBLIC WORKS ACCOUNTS.

CAPTAIN CHAMBERS arrived by the Steamer of 16th November 1859, and reported himself at this Office next day. He afterwards visited the Bengal Office of Account several times, and had long consultations with me, saw all that was doing, took away from time to time papers of all descriptions, and studied them in his own quarters, and finally, having made himself fully acquainted with our system, left on the Steamer of 23rd December 1859.

Captain Chambers will make his report to his own Government. So I only need say here that he expressed himself pleased with what he saw; and that he took away forms of all kinds for the information of the authorities at Madras.

During our consultations I obtained from Captain Chambers some of the regulations and forms of the Madras Public Works Department, and gained a general knowledge of the system of accounts in force there.

The Madras Public Works Department is for the most part arranged by Districts: in each of which is a District Engineer as the local head of the Department. Each District is divided according to extent and the importance of the works into a certain number of Executive Ranges (four or five on the average); and in each range an Assistant Engineer or Subordinate Officer of some grade, holds charge, being called in general terms the Executive Officer or Agent. These again have subordinates under them, who render the detailed accounts of works. When the

works are finished, or after the year's end if the work is not finished within the year, the Executive Officer or Agent prepares bills, sending them up with the detailed accounts to the District Engineer, who checks the bills, countersigns them, and sends them up for Audit to the Chief Engineer, without the detailed accounts.

The District Engineer also sends up to the Chief Engineer a Monthly General Account Current in which he takes credit for the expenditure, the bills due and submitted being shown in a separate Abstract attached, and which is in fact an account of Inefficient Balance standing against the Division for want of bills. The District Engineer also submits to the Chief Engineer Monthly Progress Reports showing the total expenditure on each work, and the expenditure during the month, which report corresponds with the Account Current, and is compiled from similar but more detailed reports from his Executive Officers and Agents. These Progress Reports however do not show the cost of different kinds of workmanship done.

In Bengal the Public Works Establishment is arranged by Divisions. The Divisions have no reference at all to the Civil Districts, but are fixed on considerations of convenience as to what works and what extent of country shall be under each Executive Engineer. The Divisions are again divided into subordinate charges or sub-divisions, of which the number varies greatly, the average being about nine. The Bengal Divisions have generally less extent of country and less expenditure than the Madras Districts, but are larger than the Executive Ranges. Perhaps to give a general rough idea of the relative importance of these charges it may be said that a Madras District is about equal to two Bengal Divisions, and the latter equal to two Madras Ranges; the Madras Range being equal to five Bengal Sub-Divisions.

In particular cases however there are wide differences from the average. A District Engineer in Madras may be said to hold a charge intermediate between the Superintending Engineer and Executive Engineer of Bengal.

In Bengal the detailed accounts of the works are sent by the Subordinates in charge of Sub-Divisions to the Executive Engineer, who after examination passes them on to the Central Office of Account. There they are checked in detail and abstracted, so as to form a kind of monthly bill embracing the whole expenditure of the Division, and showing in detail a comparison of the work done with the estimates in each case, with the quantities, cost, and rates of each sort of workmanship executed under each estimate. These abstracts are audited by the Superintending and Chief Engineer, a copy having been sent to the Executive Engineer for his information. The latter Officer is allowed credit for the amount passed on audit, and the abstract is lodged in the Central Office so as to bring the whole of the cash, work and store operations embraced in it under their proper heads. Besides the detailed accounts of his subordinates the Executive Engineer sends up a monthly general Account Current of his receipts and expenditure, in which he takes credit for the amount of the Abstracts passed.

In order to describe in general terms, the difference in principle between the Bengal and Madras systems of Accounts, I must premise that Public Works Accounts on the former system consist of three branches—

- I. Cash Accounts.
- II. Store Accounts.
- III. Work Accounts.

Cash expenditure takes places either directly to the works in the form of payments for labour or contract payments, or indirectly in the purchase or manufacture of stores which are either expended at

some future time in the construction of works, or, as in the case of tools, are gradually worn out after having been used more or less on several works. To test the propriety of the expenditure both of cash and stores, and to keep a proper record of it in the accounts, it is necessary to have an account of the work done as an accompaniment to the accounts of the cash and stores expended.

The process followed then is that all that is expended of the cash—that is all the credits to cash—are carried into the accounts of stores or of works, that is, are debited to stores or works. Then again all that is expended of the stores is carried to the account of the works on which it is used; or the store account is credited and the works debited with the stock expended. Lastly, when the work is finished a bill is prepared by which the work account is relieved and the charge made to Govt.

This is a general sketch. Of course the matter requires many special arrangements to suit peculiar cases; but the view I have given, seems to me to be enough for the present purpose.

Now to return to the Madras system, I think it is truly but briefly described by saying that they keep cash accounts, but they do not keep accounts of stores or works, except in a very partial and superficial way.

In the cash accounts the Madras system agrees with that of Bengal in all the most essential points of detail. They have, moreover, a very great advantage over Bengal in the nature of the Revenue system which covers the country with small Tuhseeldaree Treasuries, and affords the Executive Engineers the means of reducing their cash transactions, and adopting banking with these Treasuries to an extent which must greatly relieve themselves and benefit Govt. by reducing the cash balances required to be kept in hand.

The only improvements I can suggest in the cash accounts are the abolition of the numerous separate bills of works, and the making the monthly Progress Report a bill. This change requires a very small modification of the Progress Report. It would relieve the District Engineers of all the labour of preparing the bills, and would, I am sure, be much simpler to the Govt. Accountant than the present system. To prove which I need only say that Capt. Chambers himself would have to send in about 600 bills for the year 1858-59 for his own District in addition to twelve monthly Progress Reports. I would relieve him entirely of the former and slightly modify the latter.

It would be proper to have bills for the larger works and for the aggregate expenditure on various classes of smaller ones; but the preparation of these might be left to the Central Office spoken of further on.

I have next to advert to the store accounts. Here I think the Madras system very seriously defective. The plan is to charge all expenditure for stores direct to the works, except in the case of stores from England or from the Ordnance Dept. These latter are kept in an open account and are correctly charged off as used on the works, or, what we should term incorrectly charged to the works by degrees when not actually used.

Now the effect of this system is that the stores are liable to be lost sight of altogether. They disappear from the accounts directly they are purchased. There is nothing to show how they are disposed of afterwards, and, for all that the accounts show to the contrary, they might be carried away and expended on any body's private work. This, as I have said, is a most serious defect.

It is quite true that the whole working of the Department is under the control of the Officers of the Madras Engineers and other Officers of the Service whose

character is a sufficient guarantee that all the operations will be honestly and zealously watched, and all attempts at speculation checked by their careful and frequent inspections. But it is really impossible for any person to check complicated operations of this kind without accounts; and it is therefore certain that accounts of stores are necessary in the Madras P. W. Dept. for the protection of the Govt. interests.

But besides the liability to abuses arising from want of accounts, it is objectionable that the public accounts should not show all the property of the State. Under the system in force tools and machinery to a large value are charged off to the works and utterly disappear from the accounts of the public property, though they remain in existence in full working order. Some Officers have large and valuable workshops which should in the public accounts be represented by so much capital invested and being worked, but they are required to render no account whatever of their operations, and the Accountant General of the Madras Govt. has no official knowledge of the existence of these workshops. All the important parts of these factories have long ago been charged to the works and have disappeared from the public accounts.

The case is the same with all the stock of machinery, tools, and a portion of the materials on hand throughout the whole Presidency, except the portion which, having lately been received from England or from the Ordnance, has not been so charged; or which having been paid for in cash, but not charged off, stands in the accounts under the indefinite head of Advances.

The charges for work done show in detail, in the first instance, the number and amount of wages of workmen of all sorts who have been employed, and the quantity and cost of materials of all kinds purchased. But the nature and quantity of the work performed by the

former, or the nature and quantity of work upon which the latter have been used is not shown, except in a few cases of contract or task work. It is impossible, therefore, to say whether on the whole the charge is moderate or otherwise, and the accounts therefore afford no check on the operations of the Department, except in the very general and superficial way of comparison of the amount expended with the amount sanctioned. Even when the work is finished, quantity of each kind of workmanship done is not (or rather till very lately was not) reported or in any way mentioned in the bill, so that it was impossible even then to tell by the bill whether the charge is excessive or moderate, except by comparison in the gross with the estimate; and this check in the case of large works cannot be applied till the end of many months or years.

Here again the Madras system professes to gain the object without cumbering the accounts with details, by trusting to inspections of the work. Personal inspection by the superior Officer is, no doubt, a very necessary thing; and no accounts will be sufficient to check the expenditure on work without it. But then no man can carry in his head all the details of large and complicated works; and unless he is furnished with a statement of work done for comparison, or prepares one himself during his inspection, the main part of the advantage of the inspection, considered as a check, is lost. If such a statement is prepared (as it is ordered to be) a copy of it should accompany the accounts, and the accounts should be framed to show the details of charges for comparison with it. A mere certificate of the quantity of work done without rates being struck is, however, of no immediate use in checking expenditure. The Engineer must calculate the rates in order to make use of it.

This part of the question, so far as relates to the bills showing the quantity, and rate

of cost of work done, and to there being inspections and valuations of work, has been taken up by Col. Bell, the Chief Engineer of Madras, and he has wisely advised the Government to make a beginning of reform by showing these particulars to some extent in the case of all works exceeding Rs. 2,000 each in cost. (Madras Pro. Nos. 42-6, dated 26th September 1859).

But it is not enough to know the quantity of each sort of work done when the building is completed. This information should regularly form part of the accounts in every stage. If not, none of the persons whose business it is to check the expenditure can have any idea how far they succeed in keeping the cost down to its proper limit. And for the purpose of proving and punishing fraud, accounts containing this information would be very superior. In every stage there would be the appropriate fact recorded in the accounts themselves. So much money spent in purchasing such and such material and performing such and such work, and so much money still in hand; so much of the materials also spent on such and such work and so much still in hand. The cost of the labour and materials in the market is known: The cost of such kinds of work is within certain limits known. So that no man would charge rates greatly in excess without being certainly detected; which leads to conviction of bad management, at least. Then again the quantity of work charged for admits of test by inspection and measurement, and so do the quantities of cash and stores in hand. Here then the accounts profess to record the facts, and if the facts are found different, there is at once a proof of rendering false accounts.

But in the Madras system, the quantity of work done does not enter at all into the accounts (except in cases of task work or contract). And they thus lose one main element in the detection of fraud or bad management.

In fact, so loosely do the accounts refer to the work done, that it would often be impossible to tell from a bill or account (supposing a mere change of a word possible in the heading) whether the thing constructed was a bridge or a house. Again in bills for the repair of roads there is shown the number and cost of the labourers employed, and the quantity of gravel purchased or quarried. But there is nothing to show whether the gravel has ever been applied to the purpose intended, of metalling the road, or not. This sort of bill is a most unsatisfactory document to pass; for the object of the expenditure is to have the work done, and the bill does not show whether it has been done or not!

Independently of the advantages of stock accounts in themselves as above stated, they are necessary if the expenditure is to be compared with the progress made in the work. For instance, when a house is to be built the first operation is to collect a certain quantity of materials,—in the first place probably bricks and lime. The work to be done is so much brick-work in the walls, so much wood-work for the roofing and flooring, so much covering in of roofs and floors, &c. Now if the bricks first collected were to be charged to the walls before the walls were begun, there would of course be no proportion between the cost and the quantity of work done; and when at a later stage a small portion of wall had been built, there would be a quantity of bricks charged to it out of all proportion to the work done. Any attempt, therefore, to strike rates for comparison of the work done with the expenditure would of course fail on such a system. To obviate this the Bengal system provides stock ledgers, which contain heads for tools, petty stores, timber, bricks, lime, fuel, and other classes of stores as detailed in the Code. When bricks are purchased or manufactured, the charge is passed to the head "Bricks" in

the Stock Ledger. When some of the bricks have been used on the work during the month the head head "Bricks" in the Ledger gets credit, and the charge is made to the works; and so of other materials. In this way the charges to the works always bear a proper proportion to the work done, if the work is properly supervised. The accounts thus become a true guide to the supervising Officer in testing the expenditure throughout the whole progress of the work, whenever it is of such a nature as to be accurately tested in this way. In some cases, as in wood-work, this cannot be done so perfectly as in brick-work, because the material is made over to the workmen entirely before the work can be begun; but by a proper regulation of system, rates may be struck to some extent as the work goes on.

To return to the stock accounts. It is evident that in the case of any extensive work the bricks will often vary in price. Purchases will be made at different times at different rates. One kiln will turn out well and the bricks will be cheap, another will turn out badly and the few bricks obtained will, of course, be dear. If we were to alter the price of bricks charged to the works for each variation of this kind, the comparison of the cost to the quantity of work would not hold absolutely good, though the variations would not generally be so great as to affect its usefulness. Again, supposing a great number of separate works to be going on within a moderate distance, an Engineer will generally have only one kiln yard and from it will issue bricks to all the works. Some works will be close by, some will be at a considerable distance. If the cost of carriage be charged to the works there will be a different rate of brick-work at each, and no comparison can be made of the rates of one work with another. To obviate this difficulty the practice here is to charge the carriage to the bricks, and charge the bricks to the several

works at an uniform rate to cover all charges.

Lastly, when bricks are manufactured on a large scale, a great deal of expense has to be gone to in obtaining and preparing ground, in building kilns, moulding bricks, &c., before a single brick is burnt; and directly a kiln of bricks is ready it has to be made use of. All the preliminary and general charges cannot be borne by this first kiln. It is therefore necessary to *assume* a rate for the bricks at which to charge them to the works, and to modify this rate afterwards, if necessary, according as the account shows a profit or a loss. The assumption of a rate at first is not mere guess work. In this Presidency it is found *as a general rule* that there is one rate which assumed for a whole Executive Engineer's charge, will on the average represent with sufficient accuracy the cost of bricks in his Division. It requires to be slightly raised or lowered at times; but on the whole it does not vary except under peculiar and traceable circumstances throughout the whole Division. It has been found in fact experimentally that we can generally work with *average rates*.

This system of average rates is usually strongly objected to as a fictitious system of charges. But experience will show that it is not so. It is the only real and natural way of charging materials to works.

It is of course not to be applied indiscriminately. If there are any plain causes why materials will always be dearer at one place than at another, it would be wrong to charge both alike to the works. But, as a general rule, we do not find this.

However, this does not affect the system. It is equally workable with several rates according to actual cost of manufacture at each locality, as with one uniform rate for the whole Division. The essential point is that the Engineer shall have these heads of account as a guide, so that he may not *on the whole* charge too

much or too little, while, on the other hand, he is free to charge a reasonable proportion of the cost of the materials to his works at all stages. I have taken bricks as an example. Of course the principle is applicable to all other materials.

It may be remarked here that the Stock Ledger must not have too many heads. If it is attempted to keep a Dr. and Cr. Account for each article of stock, the result must be failure, from the complication of accounts. What is wanted is a practical guide on the whole. Absolute precision in detail of the cost of each article is unnecessary and impracticable.

When it is recollected what a vast variety of materials and kinds of work Engineers have to deal with, it will be admitted at once the Engineer's accounts must be very complicated, and very difficult to manage well, even on the best system. Officers who may be excellent Engineers often find the accounts a very heavy tax on their time, and a heavy addition to their responsibilities; while others leave the work to their Clerks and Accountants, as something which they cannot be expected to look into.

This view of the matter was strongly brought forward by the Bengal P. W. Committee of 1851, and the result was the Central Office system by which the Engineer and his subordinates had merely to send up the exact facts of the expenditure, with simple cash accounts current, which were to be abstracted, the cost of materials entered, and all properly ledgered in the Central Office, and the result furnished monthly to the Engineer for his information. The Engineer would thus be relieved of the trouble and anxiety as to his accounts, and would be left free to attend to his own proper business in designing and supervising work.

This system succeeded perfectly in the Canal Department of the N. W. P. under the supervision of its inventor, Mr. Marten;

but having been ordered to be introduced in other Chief Engineerships, before proper instructions were prepared and properly qualified Accountants provided, things fell into the confusion from which they are only now emerging.

It is evident, therefore, that to attempt any sudden change of the Madras system would be most inadvisable and dangerous. Captain Chambers has seen the Central Office, and knows the advantage of the ledgering as a means of obtaining information and giving the Chief Engineer a control over the Department. It may well be left to the Madras authorities to introduce such parts of the system as can be introduced at once without fear of failure; and the rest will follow by degrees as the want of it is felt.

It must not be supposed, however, that in Madras they get on without the difficulties and confusion we have had here. The Engineers there have workshops and sell materials to the works just as we do in our Dock ledgers. Only the transactions do not appear in the public accounts, and the confusion remains known only to those who have charge of the establishments, from which they render no official accounts at all. I have no doubt that some of these establishments will be found admirably managed, but it is not to be supposed that there are no failures in this respect, because there are no accounts submitted to bring defects to light. It will also in all probability be found that there are systems of stock accounts in some of the Districts, which the Officers keep for their own convenience, though not ordered to do so; and that in some cases there is good management, and in others, much confusion.

C. H. DICKENS, *Capt.*,  
*Offy. Secy. to Govt. of India, P. W. D.,*  
*And late in charge, Bengal Central Office of Account,*  
*P. W. Dept.*

CALCUTTA,  
 1st Feby. 1860. }

22/2/60  
10<sup>th</sup> May/60  
No 903  
No 18-19

2-1✓

No. 1663.

FROM THE OFFG. SECRETARY TO THE  
GOVERNMENT OF INDIA,  
To THE SECRETARY TO THE  
GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT,  
Fort William, 31st March 1860.

General.  
Accounts.

SIR,  
WITH reference to your letter No. 2261, dated 20th September 1859, I am directed to forward for the information of the Hon'ble the Govr. of Madras in Council, the accompanying copy\* of a printed Memo. of the result of the discussion with Captain Chambers on the Madras system of P. W. Accounts, and to request that the Govt. of India may be furnished with a copy of any report Captain Chambers may have made on the subject.

2. I am to draw the special attention of the Govt. of Madras to the subject of Stock and Work Accounts, and to state that the Govt. of India are satisfied that the defects of the Madras system are being discussed and satisfactorily disposed of by the Officers of that Presidency; and do not wish to insist upon any further change beyond what is necessary to secure the correct preparation of the Returns and Accounts (including Stock Accounts) required in the Classification Report.

3. The Govt. of India will be prepared to receive with favour any suitable proposal for the establishment of a separate Office of Audit and Account for the P. W. D. in Madras.

I have the honour to be,

SIR,

Your most obedient Servant,

*H. S. J. J.*

*H. S. J. J.*  
Offg. Secy. to the Govt. of India.

Copy to the  
1860-1861

from Bicy by C. B.  
1860-1861

1860-1861  
No. 1000

to the God of the Sea

1860-1861  
No. 1000

1860-1861

to the God of the Sea  
1860-1861  
No. 1000

1860-1861  
No. 1000

1860-1861

to the God of the Sea

to the God of the Sea  
1860-1861  
No. 1000

1860-1861

1860-1861

1860-1861