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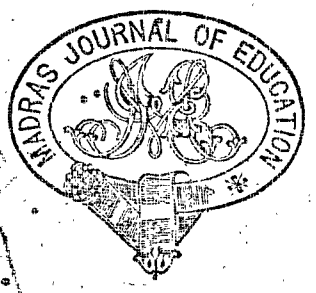
Journal of Education.

1880.



VOL. XXII.

Docendo discimus.

Madras:
MADRAS JOURNAL OF EDUCATION OFFICE.
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INDEX

TO

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THE MONTH.

We elsewhere publish an important ruling of the Director of Public Instruction with reference to pupils in Government Schools who, through sickness or other causes were absent from the late Primary School Examination.

The Managers of Aided Schools in Madras have we believe found it quite impracticable to carry out the rule strictly on this the first occasion on which the Examination has been held, and the only result of an attempt to bind boys to the rule who have reasonable excuses such as those mentioned by the Inspector of the Fourth Division will be to drive these boys away from the Schools which they have attended, and to force them to seek admission into Private Schools not under Government inspection. A clever and intelligent native boy will not readily submit to be kept back a year in his studies, and few parents would consent that he should suffer such injury. We still trust that this rule may not be so strictly enforced as to ruin our Public Schools, and to encourage private and often unqualified adventurers, who are even now too ready to set up Schools in localities where they are not needed.

The First Arts Examination.

We subjoin an analysis of the results of this Examination. Out of 620 candidates registered, 294 have passed, a pe-

centage of 47 nearly. This must be considered satisfactory. The results of Kumbhakonam are as usual brilliant, 71 passing the Examination, with a large first class of 12. The Christian College comes next in numbers, but the Presidency College from its large first class appears to have had better students. The Trevandrum, Trichinopoly S. P. G., and the Rajamandri Colleges have all done well and the success of the Kêrala Vidyasâla as a new institution has been very great.

Analysis of the F. A. Lists, December 1879.

Rank.	Names of Institutions.	Number Passed.		
		First Class.	Second Class.	Total.
1	Kumbakonam College	12	59	71
2	Madras, Christian College ...	1	30	31
3	Madras, Presidency College ...	3	17	20
4	Trivandrum Maharajah's Col...	3	19	22
5	Trichinopoly S. P. G. College...	3	12	15
6	Rajamundri College	2	13	15
7	Calicut, Kêrala Vidyasâla ...	1	12	13
8	Coimbatore College	1	10	11
9	Negapatam St. Joseph's Col ...	...	10	10
10	Mangalore Provincial College...	...	10	10
11	Tanjore S. P. G. College ...	3	5	8
12	Bangalore Central College ...	1	7	8
13	Calicut, Government College ...	1	6	7
14	Ernakulum College	3	3	6
15	Vizianagaram College	1	5	6
16	Mannhyam Noble College ...	1	4	5
17	Bangalore, Bishop Cotton's Col.	3	1	4
18	Mysore Maharajah College ...	1	2	3
19	Berhampore Govt. College ...	...	3	3
20	Bellary, Govt. College...	1	1	2
21	Cuddalore Protestant College ...	...	2	2
22	Tinnevelly Hindu College ...	...	2	2
23	Bobbili, Govt. S. S. Institution	...	2	2
24	Shenoga College	...	1	1
	Private Study	...	11	11
	Total...	47	247	294

THE MATRICULATION EXAMINATION RESULTS.

The results of the late Matriculation Examination have [illegible] considering the difficulty of some of the papers, been an [illegible] surprise. Out of 3,351 candidates registered

1,094 have proved successful, a percentage of 32·6, as compared with the 14 per cent. of last year. The ratio this time is pretty nearly the same as that of the results of 1877. The Madras Christian College takes precedence in the list with the large number of 53 successful candidates, the Kumbhakonam College comes next with 45, the Presidency College and the Trichinopoly S. P. G. College rank next. We had prepared an elaborate analysis of the list, but we have received so many letters from Head Masters of Schools complaining of the inaccuracy of the list in the *Gazette*, and claiming pupils credited to other Schools, that we have determined to defer the publication of our analysis till next month, when we hope to give comparative statements of the results in various Schools for past years, both in the First Arts and in the Matriculation Examinations. A correspondent writes as follows :—

"I beg to suggest that as several of the Colleges were not of their present status 6 or 7 years ago, it would be a fairer comparison if your table of "Numbers Passed" were to date from 1874 instead of going back to 1871. Also for the same reason the Matriculation list ought to date from 1871 instead of going back to 1867. Also there are several Schools which have appeared and done well in the analysis year after year, but have not been entered in the table of Matriculation results, *e. g.*, Combaconam Town School, because not in existence in 1867 or 1868."

We shall be happy to receive authenticated lists of numbers passed in Schools that have, as pointed out by our correspondent, not yet been entered in the general table of the results for past years. Head Masters claiming boys credited to other Schools will oblige us by giving with the name of the boy claimed, both his register number and his number on the list in order of merit.

THE MIDDLE SCHOOL EXAMINATION.

We give below an analysis taken from the *Standard* of the Results of the late Middle School Examination. Very many Aided Schools sent in no pupils for this Examination owing to the short notice given by Government, and other Schools sent in only those few pupils who wished to pass this Examination instead of the General Test to qualify for Government service. In these circumstances, it would of course be delusive to take the list as a test of the efficiency of any School.

2,110 candidates applied to be examined. Of this number 1,058 or a little more than 50 per c[illegible], have passed—197 in the First, and 861 in the Second class.

Analysis :—

Names of Institution.	Number passed.		
	First Class.	Second Class.	Total.
Presidency College	11	17	28
Doveton Protestant College	2	4	6
Provincial College, Berhampore	2	2	4
Do. Rajahmundry... ...	9	33	42
Do. Calicut	6	26	32
Do. Cuddalore...	8	12	20
Do. Salem	4	14	18
Do. Bellary	2	9	11
Government College, Mangalore	22	30	53
St. Joseph's Do. Negapatam	1	25	24
S. P. G. Do. Tanjore	1	25	26
Do. Do. Trichinopoly ...	2	7	9
Coimbatore Do.	8	40	48
Maharajah's Do. Vizianagrum ...	2	4	6
Central Do. Bangalore	2	4	6
Hindu Do. Vizagapatam ...	1	8	9
Do. Do. Tinnevelly	0	8	8
Govt. High School, Chicacole	1	7	8
Do. Kurnool	5	4	9
Do. Tiruvalur	3	9	12
Do. Tiruvadi	5	5	10
Do. Palghaut...	3	4	7
Do. Cuddapah	3	6	9
Do. Chittoor	5	11	16
Patch. High School, Madras	5	47	52
Do. Do. Chidumbarum ...	3	7	10
Do. Branch Do. Conjeveram... ...	0	9	9
S. P. G. High School, Vepery	3	16	19
Do. Do. Ramnad	0	13	13
Ch. Mis. A. V. High School Bezwada...	2	4	6
Hindu Do. Palamcottah.	2	4	6
Brannen Do. Tellicherry...	2	4	6
Town Do. Kumbakonam	6	116	122
Noble Do. Masulipatam.	0	9	9
Hindu A. V. Do. Do. ...	2	25	27
Wes. Mission Do. Negapatam ...	0	7	7
Do. Do. Mannargudi...	1	9	10
Lon. Mission Do. Coimbatore ...	0	6	6
Govt. Middle School, Saidapet	7	6	13
Do. Badugara	1	3	4

Analysis.—(Continued.)

Names of Institution.	Number passed.		
	First Class.	Second Class.	Total.
Govt. Middle School, Srirangam	2	7	9
Do. Wallajapet	2	3	5
Do. Udamalpet	0	5	5
Do. Tripatore	0	5	5
High School, Ernakulam	2	1	3
Do. Cannanore	1	7	8
F. C. M. Institution, Madras...	2	9	11
Ch., of Scot. Mis. Instn. Madras	0	3	3
Onslow Do. Chetterpore ...	0	5	5
Watdlaw Do. Bellary	0	11	11
Wes. Mission Do. Royapet	3	6	9
Lon. Do. Do. Vizagapatam ...	2	4	6
Bishop Cor. Gramr. School, Madras ...	1	10	11
St. Thomé Seminary	6	16	22
St. Mary's Do.	0	5	5
S. P. G. Do. Sawyerpuram ...	1	6	7
A. V. School, Triplicane	1	8	9
Do. Secunderabad	2	2	4
Ger. Mis. Town School, Mangalore ...	4	7	11
Am. Luth. Mis. A. V. School, Guntur...	2	10	12
Basel Mis. A. V. School, Tellicherry...	1	4	5
Do. Do. Calicut... ...	1	5	6
Nizm. Govt. Do. Hyd. & Chudder	1	5	6
Luth. Central School, Tranquebar... ...	1	13	14
St. Andrew's Do. Bangalore	2	5	7
Govt. Normal Do. Madras...	0	5	5
Govt. Madrasa-i-Auzum do	0	5	5
Davidson Street Boy's Sch. Madras ...	0	3	3
Lawrence Asylum, Ooty	5	0	5
Other Schools and Private Tuition ...	12	89	101
Total ...	197	861	1,058

THE S. P. G. Mission have sanctioned a first class College to be opened at Tanjore. As a local paper remarks, Madras was not considered a suitable station, as there are already so many colleges here. Bishop Caldwell would naturally have wished it in his own district at Sawyerpuram. But the present standard in the Sawyerpuram Seminary is the Matriculation, and the raising of it to the B.A. degree is considered impracticable. Tanjore will be more suitable; as a Brahmin centre with schools in the adjacent towns. Tanjore has this priority over Trichy—it enjoyed the honor

of having had a B.A. class from 1874 to 1878, and, in a financial point of view, the S. P. G. have to spend less at Tanjore than at Trichy, since there are already two European and three Native graduates in Mission employ. But there is this point to be considered. Tanjore is not far from Combaconum, where there is a Government College of unquestionable reputation which may tend to affect the working of the new College.

PACHIAPPA's High School has been converted into a "College" by the formation of a First Arts Class. The Trustees have also formed a Middle School, with the funds placed at their disposal by the late Lee Chengalroy Naick. The primary school is supported by the benefaction of the late Govindoo Naidu, so that the legacies of three well-known Hindus are exclusively expended on primary, middle class, and the higher education in Madras.

DAVIDSON STREET SCHOOL SPORTS.—The annual sports to the pupils of this institution came off on the Monument Esplanade last Friday evening, and there were on the ground a goodly gathering of spectators. There were flat races, high jump and the tug of war, the last created no little amount of amusement among the spectators. The sports over, prizes were awarded to the winners by Mrs. Organe, who spoke a kind word to each of the recipients. The children afterwards went in for refreshments, to which they did ample justice. The arrangements on the occasion were highly satisfactory and reflected much credit on Mr. Chester, B.A., the Head Master of the institution.—*Standard.*

EDUCATION IN PONDICHERRY.—Arrangements are being made by the educational authorities in Pondicherry to deliver courses of lectures on Physical Sciences in the Colonial College and College Calve-Souprayachetty in that town.

WE learn that the Managers of Aided Mission Schools are about to request Government that Scripture may be made one of the optional subjects for candidates going up for the Middle School Examinations.

THE Boden Professor of Sanskrit at Oxford, Mr. Monier Williams announces that he "will form classes for the Indian Civil Service. Probationers every day in the Indian Institute rooms, 8, Broad Street. The Professor will be assisted by Pandit Syamaji Krishna Varma."

UNDER the operation of the new rule added to the rules for the Gilchrist Scholarship Examination, candidates who passed that examination will be considered members of the London University.

But as the Matriculation Examination of the University is held on the second Monday in January of each year, the Gilchrist Scholarship Examination will, therefore, be held in future on that day simultaneously in the three Presidencies of Madras, Bombay, and Bengal, instead of on the third Monday in January, as heretofore.

UNIVERSITY OF MADRAS.—The following candidates are declared to have passed the M.A. Degree Examination, Mental Philosophy and Sociology, in the Second Class:—Thanu Pillai, Padmanabha Pillai, B.A.; and Sundaram Pillai, P, B.A., both private study.

B. C. E. DEGREE EXAMINATION, 1880.

Second Class.

S. Gopalakrishna Aiyar, Civil Engineering College.
S. Subramanya Aiyar, Do.
V. Nityananda Mudilyar, Civil and Private study.

Third Class.

A. Nilakanta Sastri, Civil Engineering College.
N. Rajagopaul Aiyangar, Do.

THE ENGINEERING COLLEGE.—It appears that Lieutenant Love, R.E., is to be appointed Principal of the Civil Engineering College on a reduced salary, in the place of Colonel Rogers, R.E., who has taken up the post of Superintendent of the Revenue Survey. Mr. James Bradshaw, who has held the appointment of Mathematical Master at this college for twenty years, and might reasonably have looked for promotion, still retains his old appointment, though he has latterly been employed in another sphere in the Educational Department. The Government must find it very difficult just now, we imagine, to show a *raison dêtre* for the Civil Engineering College. Have they not been dismissing Engineers and reducing expenditure on Public Works in all directions? We understand that there are only two students in the collegiate Department, and not more than half-a-dozen military students under instruction—a striking contrast to the state of things in the college a few years ago. Students will not of course enter the college if there is no prospect of employment in Government service after their studies are over. It thus comes about that the few students now in the college are being educated at a great cost, seeing that the same staff is being maintained that did the work in the palmiest days of the College. Perhaps the Government contemplate a fresh demand for subordinate engineers hereafter, but in the meantime the Madras Civil Engineering college must be regarded as a rather unprofitable establishment.—*Hindu.*

THE B.A. EXAMINATION.—One hundred and eighty-one candidates presented themselves for the late B.A. degree examination of the Madras University; of these nine were East Indians. Some of the papers were rather difficult, especially on the theory of Morals. The simplest of the questions in this branch of knowledge was—"Is there any such thing as conscience, or is what is called by that name

not a separate faculty but merely the reason employed on ethic matters?" That is a question about which philosophers have cud gelled their brains and will continue to do so till the crack of doon —*Standard.*

THE M.A. EXAMINATION.—The M.A. examination of the University wa held last week in the Senate House. There were eight candidate —seven Hindus and one East Indian. Seven candidates wer examined in History and Morals, and one in Mathematics.

CASTE GIRLS' SCHOOL.—The Church Mission Society has lately established a Caste Girls' School in Tenkasi, in the Tinnevelly dis trict. A school house has been built at an outlay of Rs. 890 and o this sum the inhabitants subscribed Rs. 300. Application was made to the Government for a building grant and a sum of Rs. 297 has been sanctioned from the educational budget. The school is in charge of the Rev. Mr. Lash, who has done much for the promotion of female education in the Tinnevelly district.

MEETING OF THE SENATE.

A MEETING of the Senate was held in the Senate House on Saturday January the 7th. There were present, Mr. Justice Innes, Vice-Chancellor, Dr. G. Smith, Mr. E. Thompson, Dr. M. C. Furnell, Dr. Bidie, Col. Shaw-Stewart, Surgeon Moideen Sheriff Bahadur, Mr. V. Krishnama Chariar, Mr. B. Lovery, Mr. Mahomed Yusuf Saib Bahadur, Colonel R. M. Macdonald, Rev. W. Stevenson, Rev. W. Miller, Rev. G. Warlow, Rev. G. M. Rae, Dr. G. U. Pope, Dr. H. Bower, and Mr. Y. Vencataramiah Garu.

It was proposed by Mr. Thompson and seconded by the Rev. W. Stevenson and carried :—That the recommendation of the Syndicate to accept the offer of the Cobden Club to award a silver medal annually to the candidate who passes for the degree of Master of Arts in the fifth Branch and obtains the highest number of marks in Political Economy be adopted.

In regard to this proposition, Mr. Krishnama Chariar was understood to say that, as the Medal and the Norton Prize were intended to encourage an intelligent study of Political Economy, something should be done to prevent any candidate carrying off the prizes for a mere perfunctory study of the subject, and suggested, for the consideration of the Senate, whether it might not be as well to prescribe a certain minimum, say a third or half, of the total marks assigned to the subject, and to award the Medal to the candidate who obtains the highest number of marks, the same being not less than the prescribed minimum. Psychology was understood to be a favourite subject of the candidates, and consequently a person might get but 10 marks out of 303 in Political Economy, and yet pass in the 4th branch of the M. A. course by securing the requisite aggregate marks in Psychology and kindred subjects, and claim the Cobden Club medal and the Norton Prize for the subject in question, to which he had paid the least attention perhaps.

The Rev. W. Stevenson, the Examiner in the 5th Branch, having been asked by Mr. Thompson to state his experience, he said that the candidates who passed generally did well in Political Economy.

The Senate, therefore, thought the evil apprehended might be corrected should it actually arise in future, and that no special legislation was necessary at present.

It was next proposed by Dr. Furnell and seconded by Dr. Bidie and carried:—That the recommendation of the Syndicate to accept the offer of Major Bertie Hobart, R.A., to found an annual prize in the University for graduates in Medicine, be adopted.

It was proposed by Dr. Furnell and seconded by Dr. Smith and carried :—That the Syndicate approve of the recommendation of the Faculty of Medicine to add the following clause to Bye-law 164 :—"Also candidates who have commenced their studies for the L. M. and S. Degree without having passed the First Examination in Arts may, should they subsequently pass that test and desire to qualify themselves for the M. B. and C. M. Degree, be permitted to count such professional courses as they had attended before passing the First Examination in Arts."

It was proposed by Colonel Macdonald and seconded by the Rev. G. Warlow and carried :—That the following addition be made to Bye-law 91 as recommended by the Syndicate :—"In Branch I. candidates failing to obtain 40 per cent. of the 550 marks allotted to English Language, Literature and Prose Composition, shall not pass."

It was proposed by Colonel Macdonald and seconded by the Rev. W. Miller, and carried :—That the recommendation of the Syndicate, that candidates for the Degree of Bachelor of Civil Engineering shall be required to produce a certificate of having studied eighteen months in an institution affiliated to the University in Civil Engineering be approved.

The meeting agreed to the recommendation of the Syndicate that the words of the Act of Incorporation which have been repealed be printed in italics with a foot-note, quoting Act XII of 1876.

The recommendation of the Syndicate to insert a new column in the forms of application for the Matriculation, F. A. and B. A examinations requiring applicants to state the number of times they have previously appeared for the examination, was next considered The suggestion originated with Government.

It was proposed by Colonel Macdonald and seconded by Mr Thompson —That the recommendation be adopted.

The Rev. Mr. Miller opposed this motion on the ground that the only advantage of having the additional column, if it could be called an advantage, was that some curious statistics would be obtained but the practical moral effect of calling for such information would be injurious, and would make the candidates think that they should aim at the mere passing of an examination as the one great aim o their school career,—the very impression that this University should strive to discourage. If the additional column be inserted, th candidates would suppose that the University regarded passing th examination as the great thing to be aimed at, and this would intensify the feeling that education is to be valued merely as a means o passing an examination and attaining a certain position, whereas th aim of the University ought to be to correct such impressions, an fix the attention of the candidates on the real work of study for it own sake.

The Senate declined to adopt the recommendation on account c the mischief likely to arise from its adoption.—*Madras Times.*

CORRESPONDENCE.

Absentees from the Primary School Examinations.

TO THE EDITOR OF THE MADRAS JOURNAL OF EDUCATION.

Sir,—As the decision of the Director of Public Instruction regarding boys absent through sickness or other causes from the Primary School Examination will interest many of your readers, I send you a copy of his Proceedings of the 2nd instant.

Faithfully yours,
John Bradshaw.

To The Director of Public Instruction.

Sir,—I have the honor to forward you several letters I have received from Head Masters of the High and Middle Schools and Deputy Inspectors asking what should be done with reference to boys who apply for admission without having appeared at the Primary School Examination, owing either to

Not being aware of its existence;
Sudden illness;
Taken by friends to some ceremony;
Small-pox;
And various similar satisfactory reasons for absence.

Also, as to whether it is necessary for a boy—who formerly belonged to the class to which he wishes to be re-admitted, or to one of the same standard in another school, to pass the examination.

Also—the Head Master, Srirangam, recommends for admission two boys who failed in his examination in Arithmetic, but obtained more than one-third of the marks in that subject at the Deputy Inspector's Inspection and more than one-third on the whole at the Head Masters' examination.

2. The Head Masters, High School Chittoor and Middle School Vallajapett, point out that a boy may fail entirely in Branch E, in the Upper Primary Examination and yet qualify on the whole for promotion—they accordingly recommend that there should be a minimum fixed for Branch E—*i.e.*, for natives seeking admission into an English Middle School.

3. I beg to recommend that as this occasion was the first on which the Primary School Examination was held, and that within three months of the Government Notification, Head Masters be allowed to admit or re-admit boys absent for the reasons assigned, if on examination they consider them fit for the class.

4. I also beg to be favoured with early Proceedings on the Head Master's letter giving a general ruling on the points raised, and that I may have a sufficient supply of copies of your Proceedings for the Head Masters of all Middle Schools and Deputy Inspectors in this Division.

I have &c.,
(Signed) John Bradshaw,
Inspector of Schools, 4th Division.

No. 421 P.

Proceedings of the Director of Public Instruction,
Madras, 2nd February 1880.

Read letter from the Inspector of Schools, 4th Division.
(Here enter 31st January 1880, No. 179.)

With the above letter Dr. Bradshaw submits several letters from Headmasters and Deputy Inspectors regarding the Notification of the 10th September 1879.

2. Some of these officers enquire whether pupils who were already in the middle school before December 1879 are required to pass the Upper Primary school examination. The reply is that they are not required to do so.

3. The next question is, what is to be done with regard to pupils who have failed to appear at the Upper or Lower Primary school examinations owing to ignorance of the rules, illness or other causes? As any Inspector or Deputy Inspector can under Rule 18 examine any pupil who is attending a primary school, unconnected with any school of a higher grade, and give him a lower primary certificate, there is not much difficulty in obtaining this certificate. All that a boy has to do is to enter a primary school, and appear for examination. With regard to the Upper Primary school examination the difficulty cannot be got over. A pupil who has failed to appear for this examination must study privately and sit next December. It is probable that such cases will not be very numerous.

4. A Headmaster wishes to promote two boys who have passed in branch A and have also obtained one-third of the aggregate number of marks, but have failed in branch B, Arithmetic. This is clearly inadmissible.

5. Certain Headmasters wish to exclude certain boys who have passed the Upper Primary school examination, but have not done well in branch E. It may be desirable that a minimum should be fixed for E, but there is no minimum at present. The boys cannot therefore be kept back.

R. M. Macdonald,
Director of Public Instruction.

To the Inspector of Schools, 4th Division, with enclosures returned.
„ other Inspectors of Schools.

Psychology in the B.A. Examination.

Sir,—The Psychology paper set by a Civil Servant, would have decided the fates of a hundred candidates. You can judge of the vagueness that attaches to the questions by being told that on the answer to the second question not two are at one. One says that it is the law of Relativity, another that it is the law of Diffusion a third positively affirms that it is the law of Self-conservation while a fourth swears to the fact that he actually heard the Professor (lecturer on Psychology) constructing a new law containing the separate elements of the laws of Relativity and Diffusion.

A Candidate for a Degree.

We publish this letter as a *bonâ fide* and characteristic production of a budding B.A., of the period. The question referred to runs thus:—"Enunciate, prove and illustrate the law connecting feelings with bodily states."

Ed. M. J. of E.

Matriculation Examination-1879.

ARITHMETIC SOLUTIONS.

I. A person purchases 18,426 articles at Rupees 2-8-9¾ each, and 2,204 articles at Rupees 4-11-7¼ each. He sells the whole number at Rupees 2-13-0 each. Find how much he gains by the transaction.

(1) Value of 18,426 articles at Rupees 2-8-9¾ each.

	Rs.	A.	P.	
	18,426	0	0	= value at R. 1 each.
			2	
	36,852	0	0	= value at Rs. 2 each.
8 As. = ½ of R. 1	9,213	0	0	= value at 8 as. each.
6 p. = 1/16 of 8 as.	575	13	0	= value at 6 p. each.
3 p. = ½ of 6 p.	287	14	6	= value at 3 p. each.
¾ p. = ¼ of 3 p.	71	15	7½	= value at ¾ p. each.
	Rs 47,000	11	1½	

(2) Value of 2,204 articles at Rs. 4-11-7¼ each.

	Rs.	A.	P.	
	2,204	0	0	= value at R. 1 each.
			4	
	8,816	0	0	= value at 4 Rs. each.
8 As. = ½ of R. 1	1,102	0	0	= value at 8 as. each.
2 As. = ¼ of 8 as.	275	8	0	= value at 2 as. each.
1 A. = ½ of 2 as.	137	12	0	= value at 1 a. each.
6 p. = 1/16 of 1 a.	68	14	0	= value at 6 p. each.
1 p. = 1/6 of 6 p.	11	7	8	= value at 1 p. each.
¼ p. = ¼ of 1 p.	2	13	11	= value at ¼ p. each.
	Rs. 10,414	7	7	= value of 2,204 articles.
	47,000	11	1½	= " " 18,426 "
	57,415	2	8½	= " " 20,630 "

But the 20,630 articles are sold at Rs. 2-13-0 each.

(3) Value of 20,630 articles at Rs. 2-13-0 each.

	Rs.	A.	P.	
	20,630	0	0	= value at R. 1 each.
			2	
	41,260	0	0	= value at R. 2 each.
8 As. = ½ of R. 1	10,315	0	0	= value at 8 as. each.
4 As. = ¼ of 8 as.	5,157	8	0	= value at 4 as. each.
1 A. = ¼ of 4 as.	1,289	6	0	= value at 1 a. each.
	58,021	14	0	= value of 20,630 articles.

Rs.	A.	P.	
58,021	14	0	= selling price of the whole numb
57,415	2	8½	= cost price of the whole number.
∴ 606	11	3½	= gained by the transaction. Ans

II. In 12 days 20 men could finish a piece of work. Being assisted by 6 women for 5 days, and by 10 women for the rest of the time, the work is done in 9 days. How long would 28 women take to do the work?

20 men can finish the work in 12 days.
∴ 20 men could finish in 1 day 1/12 of the work.
∴ 20 men could finish in 9 days 9/12 or ¾ of the work.

Because they finish the work in 9 days, the remaining ¼ work must be done by 6 women working 5 days and 10 women working 4 days, or 70 women working at it one day.

Now 70 women could finish ¼ of the work in 1 day.
∴ 1 woman could finish 1/70 of the work in 70 days.
∴ 1 woman could finish the whole work in 70 × 4 days.

$$\therefore \text{ 28 women could finish the whole work } \frac{70 \times 4}{28} = 10 \text{ days}$$

10 days Answer.

III. A sold a horse to B, who sold it to C at a loss of 10 per cent. C sold it for Rupees 891, and cleared 20 per cent. on his bargain. What did B give for the horse, and what gain per cent. was the last price on the first price?

(1) C sold the horse for Rs. 891 and gained 20 per cent.
That is Rs. 120 is the selling price of Rs. 100, the cost price.

∴ 1 is the selling price of Rs. $\frac{100}{120}$

$$\therefore \text{ 891 is the selling price of } \frac{100}{120} \times 891 \text{ or } \frac{4455}{6}$$

∴ Rs. $\frac{4455}{6}$ is the price which C gave B for the horse.

But B sold it to C at a loss of 10 per cent.
That is, B received Rs. 90 for every 100

∴ B received R. 1 for every $\frac{100}{90}$

$$\therefore \text{ B} \frac{4455}{6} \frac{100 \times 4455}{6 \times 90} \text{ or } 825$$

∴ Rs. 825 is the price which B gave for the horse Ans. (1)

(2) Rs. 891 is the last price
Rs. 825 is the first price
∴ Rs. 66 is the gain on the first price
Now the gain on Rs. 825 is Rs. 66

$$\therefore \text{ 1} \frac{66}{825} \text{ Rs.}$$

$$\therefore \quad \frac{}{} \quad 100 \quad \frac{66 \times 100}{825} = \text{Rs. } 8.$$

8 per cent. Answer (2)

IV. Find the value of ·96 of Rupees 9-1-0 + ·5925 of Rupe 7-5-0 + ·0027 of Rupees 13-0-4.

$\frac{96}{99}$ of Rs. 9-1-0 + $\frac{5920}{9990}$ of Rs. 7-5-0 + $\frac{27}{10000}$ of Rs. 13-0-4.

$\frac{32}{33} \times \frac{583}{64}$ Rs. + $\frac{592}{999} \times \frac{117}{16}$ Rs. + $\frac{27}{10000} \times \frac{625}{48}$ Rs.

$\frac{53}{6}$ Rs. + $\frac{13}{3}$ Rs. + $\frac{9}{256}$ Rs.

$8\frac{5}{6}$ Rs. + $4\frac{1}{3}$ Rs. + $\frac{9}{255}$ Rs.

12 Rs. + $\left(\frac{5}{6} + \frac{1}{3} + \frac{9}{256}\right)$ Rs.

12 Rs. + $\frac{640 + 256 + 27}{768}$ Rs.

12 Rs. + $\frac{923}{768}$ Rs.

12 Rs. + $1\frac{155}{768}$ Rs.

13 Rs. + $\frac{155}{768}$ Rs.

Rs. 13-3-$2\frac{3}{4}$ Answer.

V. Extract the square root of 4·376 and of $\frac{3}{5}$ each to four places of decimals,

(1) 4·37600000 (2·0918 Answer (1)

	4	
409	3760	
	3681	
4181	7900	
	4181	
41823	371900	
	334584	
	37316	

(2) 0·6000000 (·7745 Answer (2)

	25	
147	833	
	749	
1545	8400	
	7725	
15494	67500	
	61976	
	5524	

VI. An oblong plot of ground measures 57 feet 3 inches × 36 feet 7 inches. From the centre of each side a path 5 feet 4 inches wide goes across to the centre of the opposite side. Find the cost of paving these paths at the rate of Rupee 1-5-0 per square yard.

Area of the path =

$$\left\{\left(57\frac{3}{4} + 36\frac{7}{12}\right)\frac{16}{3} - \frac{16}{3} \times \frac{16}{3}\right\} \text{ square feet.}$$

$$93\frac{5}{6} \times \frac{16}{3} - \frac{256}{9} \text{ square feet.}$$

$$\frac{9008}{18} - \frac{256}{9} \text{ square feet.}$$

$$\frac{8496}{18} \text{ square feet} = \frac{8496}{18 \times 9} \text{ or } \frac{8496}{162} \text{ square yards.}$$

Now the cost per square yard is Rupee 1-5-0 or $\frac{21}{16}$ Rupees.

Therefore the cost of paving these paths is

$$\frac{531}{\cancel{8496}\ \cancel{162}\ 54} \times \frac{7}{\cancel{21}\ \cancel{16}} = \frac{3717}{54} = 68\frac{5}{6} \text{ Rs. or}$$

Rs. 68-13-4 Answer.

VII. On what sum will the difference between the simple and compound interest for 3 years at 5 per cent. per annum amount to Rupees 13-11-7½ ?

(1) The simple interest on Rs. 100 for 3 years at 5 per cent. per annum is Rs 15.

(2) The compound interest on Rs. 100 for 3 years at 5 per cent. per annum.

5 p. c. is $\frac{1}{20}$ of 100	Rs. 100-0-0
	5-0-0 Interest for first year.
5 p. c. is $\frac{1}{20}$ of 100	Rs. 105-0-0
	5-4-0 " " 2nd "
$\frac{5}{6}$ p. c. is $\frac{1}{120}$ of 100	Rs. 110-4-0
	5-8-2$\frac{2}{5}$ " " 3rd "
	Rs. 115-12-2$\frac{2}{5}$ Amount of 3rd year.
	100- 0-0 Principal of 1st year.
	Rs. 15-12-2$\frac{2}{5}$ Compound interest for 3 years at 5 per cent
	15- 0-0 Simple Interest for Do.
	12-2$\frac{2}{5}$ = Difference between the

simple and compound interest on Rs. 100 for 3 years at 5 per cent per annum.

Now 12 As. 2$\frac{2}{5}$ P = $\frac{61}{80}$ Rs.

$\frac{61}{80}$ Rs. is the difference between the simple and compound interest on Rs. 100.

∴ 1 R. ..... $\frac{100 \times 80}{61}$ Rs.

∴ Rs. 13-11-7$\frac{1}{5}$ or Rs. $\frac{549}{40}$ ..... $\frac{\overset{5}{\cancel{100}} \times \overset{40}{\cancel{80}} \times \overset{9}{\cancel{549}}}{\underset{2}{\cancel{61}} \times \underset{}{\cancel{40}}}$ or

Rs. 1800 Answer.

VIII. A person in England has a certain sum invested in Indian 4½ per cent. Government bonds, which after deducting 2 per cent. as Agent's charges for drawing and remitting the money, and when the rate of exchange is 1*s.* 7½*d.* per rupee, brings him in an income of £429-19-6 per annum. Find the amount of the investment in Rupees.

The rate of exchange is 1*s.* 7½*d.* per rupee.

∴ 1*s.* 7½*d.* = 1 R.

∴ 1$\frac{3}{5}$*s.* or $\frac{13}{160}$ £. = 1 R.

∴ " 1 £ = $\frac{160}{13}$ Rs.

∴ £429-19-6 = $\frac{\overset{4}{\cancel{160}}}{\underset{13}{\cancel{13}}} \times \frac{\overset{1323}{\cancel{17199}}}{\underset{10}{\cancel{10}}}$ Rs. or 1323 × 4 Rs.

= 5292 Rupee

Now 5292 Rupees is the income per annum after the reduction of 2 per cent. as Agent's charges for drawing and remitting the money.

∴ He receives 98 Rs. out of an income of 100 Rs.

∴ 1 ——— $\frac{100}{98}$ Rs. or $\frac{50}{49}$

∴ 5292 Rs. ——— $\frac{\overset{108}{\cancel{5292}} \times 50}{\underset{1}{\cancel{49}}}$ = 5400 Rupees.

He invests a certain sum in Indian 4½ per cent. Govt. bonds.

∴ To obtain 4½ he invested 100 Rs.

∴ 1 ——— $\frac{100 \times 2}{9}$ Rs.

∴ 5400 ——— $\frac{\overset{600}{\cancel{100}} \times 2 \times \overset{}{\cancel{5400}}}{\underset{9}{\cancel{9}}}$ = 1,20,000 Rs.

∴ Rs. 1,20,000 is the amount of the investment. Ans.

IX. A train 132 yards in length, travelling at a uniform speed, overtook a man walking along the line at the rate of 6 miles an hour, and passed him in 12 seconds. Twenty minutes later the train overtook a second man, and passed him in 11 seconds. How many hours after the train overtook the second man would the first man also overtake him?

The 1st man in 1 hour walks 6 miles.

∴ ——— 1 second $\frac{6}{60 \times 60}$ miles.

∴ ——— 12 " $\frac{\overset{1}{\cancel{6}} \times \overset{1}{\cancel{12}}}{\underset{10}{\cancel{60}} \times \underset{5}{\cancel{60}}} = \frac{1}{50}$ mile.

$= \frac{1}{\underset{5}{\cancel{50}}} \times \frac{\overset{176}{\cancel{1760}}}{1}$ yards = 35$\frac{1}{5}$ yards.

Now the train passed him in 12". Therefore the distance travelled by the train in 12" is 35$\frac{1}{5}$ yards + 132 yards (*i. e.*, the length of the train) = 167$\frac{1}{5}$ yards.

∴ the train in 1" goes $\frac{836}{5 \times 12}$ yards.

∴ ——— 1 hour goes ——— $\frac{836 \times 60 \times 60}{5 \times 12}$ yards.

$$\therefore \text{——} 1 \text{——} \frac{\overset{19}{\cancel{209}} \quad \overset{3}{\cancel{836}} \times \cancel{60}}{\underset{44}{\underset{22}{\underset{2}{\cancel{1760}}}}} = \frac{57}{2} = 28\tfrac{1}{2} \text{ miles.}$$

Again the speed of the train in 12″ is $\frac{836}{5}$ yards.

$$\therefore \text{——} 1'' \text{ is } \frac{836}{5\times 12} \text{ yards.}$$

$$\therefore \text{——} 11'' \text{ is } \frac{\overset{209}{\cancel{836}}\times 11}{5\times\cancel{12}_{3}} \text{ yards } \frac{2299}{15}.$$

$$153\tfrac{4}{15} \text{ yards.}$$

Now the train passed the 2nd person in 11″.

∴ the distance travelled by the 2nd person in 11″ is

$$153\tfrac{4}{15} - 132 = 21\tfrac{4}{15} \text{ yards.}$$

$$\therefore \text{ the 2nd person travels in } 1'' \text{——} \frac{\overset{29}{\cancel{319}}}{\underset{4}{\cancel{15}\times\cancel{11}}} = \frac{29}{15} \text{ yards}$$

$$\therefore \text{ 1 hour } \frac{29\times 60\times\cancel{60}}{\cancel{15}} \text{ yards.}$$

$$= \frac{29\times 60\times 4}{1}$$

$$\therefore \text{ 1 hour } \frac{29\times\cancel{60}\times 4}{\underset{22}{\underset{44}{\cancel{1760}}}} = \frac{87}{22} \text{ miles.}$$

$$= 3\tfrac{21}{22} \text{ miles.}$$

Now the distance travelled by the train in 20′ is $\frac{1}{3}$ of $28\frac{1}{2} = 9\frac{1}{2}$ miles.

and ——————————1st man in 20′ is $\frac{1}{3}$ of $6 = 2$ miles.

∴ the distance between the 1st man and the 2nd man is $9\frac{1}{2} - 2 = 7\frac{1}{2}$ miles and the distance gained by the 1st man over the 2nd man in 1 hour is $6 - 3\frac{21}{22}$ or $2\frac{1}{22}$ miles.

∴ 1 mile is gained by him in $\frac{22}{45}$ hours.

$$\therefore 7\tfrac{1}{2} \text{ miles are gained in } \frac{\overset{11}{\cancel{22}}\times\cancel{15}}{\underset{3}{\cancel{45}\times\cancel{2}}} = \frac{11}{3} = 3\tfrac{2}{3} \text{ hours.}$$

or 3 hours and 40 minutes.

In 3 hours and 40 minutes. Answer.

EXAMINATIONS FOR THE INDIAN CIVIL SERVICE.

Open Competition of 1880.

For the guidance of Candidates who may have a difficulty in making their selections for special study under the heads of English History and Literature, the following lists are given as indicating the character and amount of reading that would be regarded as satisfactory.

History of England.

Any one of the following periods, to be studied generally in "Bright's History," and specially in portions, selected by the Candidates, of the Text-books named :—

1. *Henry II. to Edward III., A. D.* 1154-1377.—Stubbs' Select Charters ; Stubbs' Constitutional History of England.
2. *The Tudors, A.D.* 1485-1603.—Hallam's Constitutional History of England ; Froude's History of England.
3. *The Stuarts, A. D.* 1603-1714.—Hallam's Constitutional History of England ; Macaulay's History of England.
4. *A. D.* 1714-1805.—Lord Stanhope's History ; Sir T. E. May's Constitutional History ; *either* Massey's Reign of George III. *or* Lord Stanhope's Life of Pitt.

English Literature.

Poetry.

Shakespeare.—Three plays, one from each of the following groups :—

(*a*) Macbeth, Othello, Lear, Hamlet.
(*b*) Coriolanus, Julius Cæsar, King John, Henry V.
(*c*) Tempest, Merchant of Venice, Romeo and Juliet, As You Like it.

And any two of the following : —

1. *Chaucer.*—Prologue to the Canterbury Tales, with the Prioress' Tale, and the Clerk's Tale ; or *Spenser.*—Faerie Queene, Books 1 & 2.
2. *Milton.*—First four books of Paradise Lost *or* Paradise Regained, *or* Comus and Samson Agonistes.
3. *Dryden.*—Absalom and Achitophel, and The Hind and Panther.
4. *Pope.*—Essay on Criticism ; with *either* imitations of Satires and Epistles of Horace, *or* Essay on Man.
5. *Gray.*—Poems.

PROSE.

Bacon.—Essays, *or* Advancement of Learning.

And any two of the following :—

1. *Milton.*—Areopagitica; *and Locke.*—On the Conduct of the Understanding.

2. *Clarendon.*—History of the Rebellion, from the Treaty between the King and the Parliament, at the end of Book VI., to the Death and Character of Falkland in Book VII.; and *De Foe.*—Memoirs of a Cavalier (ch. viii. to the end).

3. *Addison.*—Selections (Clarendon Press Series), Parts 1, 2, 3, 6, and 7.

4. *Johnson.*—"Six Chief Lives of the Poets," *viz.*, of Milton, Dryden, Swift, Addison, Pope, and Gray; with Macaulay's Biography of Johnson.

5. *Burke.*—Reflexions on the French Revolution; *or* Appeal from New to Old Whigs, with Speech on American Taxation.

6. *Macaulay.*—Essays on Addison, Byron, Walpole, Mackintosh, Temple, and Madame D'Arblay.

*CIVIL SERVICE OF INDIA**

FORM OF APPLICATION TO BE FILLED UP BY CANDIDATES.

*** *This Form must be sent so as to be received at the Office of the Civil Service Commission before the 1st of April, 1880.*

Date

Sir,

Being desirous to offer myself as a Candidate at the Examination for the Civil Service of India, which is appointed to commence on the 15th of June, 1880, I transmit herewith, as required by the Regulations—

(1.) A certificate of my birth, showing that I was born on the day of 18 , and that therefore my age will be above 17 years on the 1st of June, 1880, and under 19 years on the 1st of January, 1880.

(1.) If a General Register Office certificate cannot be obtained, the instructions printed on the other side will show what evidence should be supplied. If evidence is *already* in the hands of the Commissioners, strike out "A certificate of my birth," and insert "Evidence is already in the possession of the Commissioners."

(2.) A certificate signed by

of my having "no disease, constitutional affection, or bodily infirmity unfitting me for the Civil Service of India."

(2.) The terms indicated by the marks of quotation must appear in the certificate, which must be given after personal examination, and bear date not earlier than 1st March, 1880.

* For the Regulations see the number of the Journal for December 1879.

(3.) Proof of my moral character, *viz* :—

(1.) A testimonial from

(2.) A testimonial from

(3.) Two testimonials must be sent bearing date not earlier than 1st March, 1880. One of them should be given by an intimate acquaintance (not a relative) of not less than three or four years standing; the other, if the candidate has recently left school, should be given by his late schoolmaster, or if he has had employment of any kind, by his late employer. If the candidate has been at any University, he should send a certificate of good conduct from his College tutor.

(4.) A statement of the branches of knowledge in which I desire to be examined.

(4.) This should be given on the form annexed. If the History of England or English Litterature be named, the schedule on the fourth page should also be filled up.

I have also to state, with reference to Section 2, Clause (i) of the Regulations, that I am a natural-born subject of Her Majesty.

I am, Sir,

Your obedient Servant,

Name in full

Address

To the Secretary,
Civil Service Commission.

Evidence of age to be required from Candidates for the Civil Service of India.

I. Every Candidate born in England or Wales should produce a Certificate from the Registrar-General of Births, Marriages, and Deaths, or from one of his provincial Officers. This Certificate may be obtained at Somerset House, or from the Superintendent Registrar of the District in which the birth took place.

II. A Candidate who is a Native of India must have his age certified by the Government of India, or of the Presidency or Province in which he may have resided.

III. Every other Candidate *not producing the Certificate* mentioned in Clause I. must prove his age by Statutory Declaration, and should also, if possible, produce a record of Birth or Baptism from some official Register; under which term may be included the Parochial Registers of Baptisms, the non-Parochial Registers of Baptisms and Births deposited at Somerset House under Acts of Parliament, the Register kept at the India Office of persons born in India, &c., &c. This Regulation applies—

1. To all Candidates not born in England or Wales.
2. To Candidates, who, though born in England or Wales, cannot produce the Registrar-General's Certificate.

The Civil Service Commissioners reserve to themselves the right of deciding in each case upon the sufficiency of the evidence produced, but they subjoin the following general rules for the guidance of Candidates :—

(*a*). The Declaration should specify precisely the date and place of birth, and should, if possible, be made by the father or mother of the Candidate. If made by any other person

it should state the circumstances which enabled the Declarant to speak to the fact. If an entry in a Bible or other family record be referred to, the Bible or other record must be produced at the time of making the Declaration, and must be mentioned in the Declaration as having been so produced.

(b.) If the Candidate was born in England or Wales, the Declaration must contain a statement, that after due inquiry no entry has been found in the books of the Registrar-General; or a separate Declaration must be made to that effect.

(c.) If no extract from any Register is produced, the Declaration must contain a statement, that after due inquiry no such Record is believed to exist; or a separate Declaration must be made to that effect.

(d.) Statutory Declarations must be exactly in the form prescribed by the Acts of 5 and 6 William IV., c. 62. A printed form, if required, will be supplied on application to the Civil Service Commissioners.

N.B.—Clergymen, as such, are not qualified to take Declarations.

Civil Service of India.

Open Competition of June and July, 1880.

Selection of Subjects.

**** Place your Initials against the Subjects which you select, and strike out the remainder.*

		Initials.
	English Composition	
	*History of England	
	*English Literature	
	Greek	
	Latin	
	French	
	German	
	Italian	
	Mathematics (Pure)	
	„ (Mixed)	
	Natural Science, viz.:—	
Two of these only may be selected.	Chemistry	
	Electricity and Magnetism	
	Experimental Laws of Heat and Light	
	Mechanical Philosophy and Astronomy	
	Logic	
	Elementary of Political Economy	
	Sanskrit	
	Arabic	

Signature

Date

* State Periods and Books selected on the other side of this sheet.

Civil Service of India.

Open Competition of June and July, 1880.

History of England.—Period selected by the undersigned Candidate:—

English Literature.—Books selected by the undersigned Candidate:—

Signature

NATIONAL INDIAN ASSOCIATION.

Of late years an increasing disposition has been shown by native gentlemen in India to send their sons to be educated in England. Under proper safeguards such a course is eminently deserving of encouragement, the benefit to be gained by a native of India from a well directed visit to England, in enlargement of view and improved knowledge of English society and ways of thought, being universally admitted.

It appears, however, that many Indian parents who are anxious to send their children to England are deterred from doing so by the difficulty of securing any adequate supervision over them. Removed from all the influences and restraints of home, and placed in a foreign country, a native youth is unnecessarily exposed to considerable temptation, while his parent has no sure means of obtaining information of his conduct, or of ascertaining whether his time is spent profitably or otherwise.

It has been thought by some persons who are interested in the welfare of India that if this want of supervision could in any way be met, and greater facility given to the upper classes to educate their sons in England, a material benefit would be conferred on the natives of India, and good service rendered at the same time to the State.

A meeting recently held in London to consider this question was attended by the Earl of Northbrook, Sir Barrow Ellis, Sir Henry Davies, Sir William Muir, Sir Arthur Hobhouse, Colonel Keatinge, and several Members of the National Indian Association, which has for two or three years past, in addition to other work, rendered friendly assistance to native students living in this country.

It was ascertained at this meeting that the National Indian Association was not unwilling to extend its operations, and to establish, if it should be thought feasible, an organisation for the purpose of supplying information and assistance to native gentlemen desirous of educating their sons in England, and also of exercising a general control over those native students whose supervision the Association might, after inquiry, arrange to undertake.

A Committee was appointed to consider the best method of carrying out such a scheme, and a Report embodying their proposals, with a set of Rules (of which a copy is appended), was approved and adopted by the National Indian Association on the 25th of June. A permanent Sub-Committee, composed of the Earl of Northbrook, Sir Barrow Ellis, Sir Henry Davies, Sir Arthur Hobhouse, and Mr. Seymour V. FitzGerald was at the same time appointed to give effect to the proposals, and it was resolved that the scheme of the

had poured into India, and in the middle of last century six such invasions on a great scale occurred in twenty-three years, such invasion signifying not merely a host of from 20,000 to 100,000 barbarians on the march, paying for nothing, and eating up every town and cottage and farm-yard on the way, burning and slaughtering on the slightest provocation, and often in mere sport, but also a grand final massacre at the capital of the invaded country. In the first of these six invasions, led by a soldier of fortune from Persia, 8,000 men, women and children were hacked to pieces in one forenoon in the streets of Delhi; while the five Afghan invasions which followed formed one of the most appalling tales of bloodshed and wanton cruelty ever inflicted on the human race. During these years, the border land between Afghanistan and India lay silent and waste; indeed, districts far within the frontier which had once been thickly peopled and were now again thickly peopled swept bare of inhabitants. The Afghan question survived to this day, but its present form, although by no means easy of solution, was preferable to the shape in which it presented itself in the last century. That question had now passed beyond the range of purely Indian politics, and must be decided by the deliberate voice of the British Parliament. British officials in India were neither Whigs nor Tories, but simply a body of administrators doing their best to govern an Asiatic country without reference to European politics and in the interests of the people themselves. The task, in its present dimensions, was a sufficiently vast one, and so far as he might speak for those officials he should say that neither did they desire annexation nor did they shrink from the responsibility which annexation, when necessary, involved. It was for the British nation not for their Indian servants to settle the future of Afghanistan; but if the nation resolved that Afghanistan was to cease to be a turbulent neighbour, and that she was to become henceforth a well-ordered part of the Indian Empire, then the past history of that Empire showed that there would be no permanent difficulty in giving effect to that decision. British rule had taught more unruly, more numerous and far better organized races than the Afghans the lesson of settling down into peaceful industry. That lesson was not to be taught in a single year, and both teachers and learners might make some serious mistakes at first; but the task of dealing with Afghanistan was one of less magnitude than the task of dealing with the Punjab was thirty years ago. If Great Britain decided that a similar course was to be adopted in Afghanistan as was adopted in the Punjab, the same results would follow. Indian soldiers had again proved that they knew how to conquer, and Indian administrators would again show that they knew how to govern. The mass of the Afghanistan people, no longer ground down by the military clans, would find that a new era of prosperity and security had begun; while before ten years were over, the military clans of Afghanistan would pride themselves, as our late enemies the Goorkhas and the Sikhs now did, on supplying the best disciplined and most loyal regiments to our Indian Army. Another frontier people would be added to the long list of wild races who had turned their spears into pruning-hooks under British rule. In the last century, Dr. Hunter proceeded to remark, invasions were yearly events along the whole frontier of India. The Himalayas formed a line of fortresses from which the hill races poured down

upon the plains, and for more than 1,500 miles along their foot stretched a thick belt of territory which no one dared to cultivate. On the north-eastern border, again, the history of the fertile valleys of Assam was one long narrative of invasion and extermination. The great mountain wall round Northern India failed, therefore, till the British came upon the scene, to afford any security to the Indian races. The sea, which formed the natural defence of the rest of the country, was in like manner only a source of new dangers being infested by pirates who burnt the villages and massacred or carried off into slavery the inhabitants. This state of things could not be permitted under British rule, and the first business of England was to secure India from foreign invasions. The sea robbers were effectively dealt with and the Indian waters rendered as safe as the English Channel. The subjugation of the unruly tribes of the Himalayan frontier took a longer time and was less complete, as our troubles with Afghanistan attested. But by persuasion, and when necessary by chastisement, we had taught the wild races along the whole north-eastern frontier, for a distance of 1,500 miles, that they must keep quiet and betake themselves to some other livelihood than the pillage of the husbandmen on the plains. Most of them had been apt scholars. The great kingdom of Nepaul, on the north, which forced us to correct its inveterate practice of raiding by two campaigns, followed by partial annexation, had for the last sixty years been our firm ally. Other Native States, like the Principality of Cooch Behar at once settled down into peaceful industry, its first and only treaty with us, dated 1773, remaining unbroken by their party of this day. A firm frontier being established, the peasantry spread themselves out upon the fertile depopulated lands. The task of reclaiming those tracts had been a heavy one. In some parts, as in the now populous district of Goalpara, more money was spent until twenty-five years ago by Government in rewards for killing the wild beasts than the whole sum realized from the revenue. While the natives of India had pushed their rice cultivation towards the foot of the mountains, English capitalists had dotted their slopes with tea plants. Not less than 13,000 square miles of this border land had been reclaimed, and yielded each year sixteen millions sterling worth of food, the tea gardens alone exporting last year three millions' worth of tea, chiefly to England. They had heard a good deal about a scientific frontier for India. He was not going to say a word on that vexed subject, but it would be well to realize the meaning of an unscientific frontier in India. The unscientific frontier of the last century suggested that 60,000 square miles of border land were abandoned to jungle and wild beasts, not because there were no people to cultivate the soil, but because they did not dare to do so. An unscientific frontier signified a tract which might have yielded thirty millions sterling worth of food each year lying untilled through terror of the turbulent hill races. The improvement effected by a century of British rule in this old unscientific frontier meant that 13,000 square miles had been brought under the plough, yielding each year sixteen millions' worth of food, or more than the whole cost of the Indian Army and of the defence of the Indian Empire. But the task of freeing India from foreign invasion was not the only responsibility which the acquisition of the country entailed. The dying throes of

Thursday, 18th December, 10 A.M. to 12 Noon.

GEOMETRY.

Examiners. { V. Srinivasa Aiyar, B.A.
Charles Waters, M.A.

The Answers to Parts I, and II, must be written in separate books

Part I.

I. The angles at the base of an isosceles triangle are equal to one another.

II. The straight lines which join the extremities of two equal and parallel straight lines towards the same parts, are also themselves equal and parallel.

From an extremity of each of two diameters of a circle equal and parallel straight lines are drawn in the same direction, and from the other extremity of each, two other equal and parallel lines are drawn in the same direction. Prove that the lines joining the extremities of these so as to cross will bisect each other.

III. If a straight line be divided into any two parts, the squares on the whole line, and on one of the parts, are equal to twice the rectangle contained by the whole and that part, together with the square on the other part.

From a point O within a square ABCD, OE is drawn perpendicular to AB. Prove that the difference of the squares on AO, OC, together with twice the square on AB is equal to the rectangle contained by AB and twice the sum of AE, OE.

Part II.

IV. To divide a straight line into two parts, so that the rectangle contained by the whole and one of the parts may be equal to the square on the other part.

V. The opposite angles of any quadrilateral figure inscribed in a circle are together equal to two right angles.

PT, QT are tangents to a circle, centre O, at P and Q. PR, QR bisect the angle OPT, and the angle exterior to OQT. Show that the centre of the circle passing through Q, R, T, bisects OT.

VI. If from a point without a circle two straight lines be drawn, one of which cuts the circle *but does not pass through the centre*, and the other touches it; the rectangle contained by the whole line which cuts the circle, and the part of it without the circle, shall be equal to the square on the line which touches it.

Two straight lines PBC, PDE are drawn from an external point P cutting two circles ABC, CDE, which touch externally at C, A being the point where EC produced cuts the circle ABC. AB produced meets the straight line PDE in F. Shew that the rectangle contained by PF, PD is equal to the square on the line drawn from P to touch the circle ABC.

Thursday, 18th December, 2 to 5 P.M.

INDIAN HISTORY.

Examiners. { D. Sinclair, M.A.
Edn B. Powell, B.A., LL.B.
Rev. G. U. Pope, D.D.

The Answers to Parts I, II and III must be written in separate books.

Part I.

I. Explain the terms (1) *Bhârata varsha*. (2) *Brahmavarta*, (3) *Brahmarshidêsa*, (4) *Madhyadêsa*, and (5) *Aryavarta*.

II. (1.) With what Hindu sovereign did *Seleucus* fight?
(2.) From whom do we gather information about that period?
(3.) What was the capital of this antagonist of *Seleucus*?
(4.) Whom had he conquered?
(5.) Who, according to tradition, was his father-in-law?

III. Can you mention any circumstances in Indian history connected with, (1) 'a faithful horsekeeper,' (2) 'uninvited wedding guests,' and (3) 'a man employed to imprison his own grandfather'?

IV. (1.) For what is India indebted to the administration of the Marquis of Hastings (Earl Moira)?
(2.) Give the names of the places where five battles were fought in 1817, 1818; and
(3.) Mention one important particular regarding each battle.

Part II.

V. (1.) Who was *Asoka*? (2) mention his date, (3) his dynasty, (4) his religion, (5) his assumed name, and (6) a meeting at which he was present.

VI. (1.) The Moors invaded Spain in the VIIIth Century, A.D.; what happened in India, about the same time, of a similar character?
(2.) What events occurred in 1001, 1022, 1294, 1347?

VII. (1.) Who was the founder of the Huidarâbâd (Dakhan) dominion?
(2.) Give a short account of any one of his sons; and
(3.) Of one of his grandsons.
(4.) Mention three of his contemporaries in 1720.

VIII. (1.) Who was Dôst Muhammad?
What claim had Shah Sûja to the throne of Afghânistân?
(2.) What happened with regard to that country in 1808?
(3.) Give some account of Ahmed Shâh Abdâli.
(4.) For what is Jellâlâbâd famous?

Part III.

IX. (1.) Who were the three leaders against whom the English fought in 1764?
(2.) Why is this struggle very memorable?
(3.) What two rivals were contending in another part of India, at the same time?

X. 'The four wars, as the result of the last of which, the *short liv'd* but *vigorous* Muhammadan usurpation in Seringapatam was extinguished, and the *ancient* Hindu Raj restored, under the auspices of Britain.'

(1.) Give the dates of the beginning and end of each of these wars.
(2.) Justify the use of each of the words in italics.
(3.) Has trouble since arisen from any members of the dispossessed family?

XI. (1.) What very important battle was fought in 1740?
(2.) What great man died in that year?
(3.) What was the condition of Delhi just then?
(4.) Name 4 persons then in the prime of their vigour.

XII. (1.) Who was Chanda Saheb?
(2.) Who was his son?
(3.) When did he come in contact with Clive?
(4.) Relate the story of this encounter in two or three lines.

Friday, 19th December, 10 A.M. to 12 P.M.

PHYSICS.

Examiners. { C. Nagogi Rau, B.A. / J. Cook, M.A.

The Answers to Parts I and II must be written in separate books.

Part I.

I. Is the centre of gravity of a body necessarily *in* the body? Describe any experiment you might show to illustrate your answer.

II. Correct the following statement so as to make it physically accurate:—"*The surface of a liquid is horizontal.*" Give, briefly, reasons for your correction.

III. If I varnish a lump of gold, whose specific gravity is 19, and weight 1 lb., and weigh it (i) in water and (ii) in mercury, what will be its apparent weight in each case? Explain fully the reasons for your answer.

IV. (*a.*) Define *energy* and *work*; and state how they are measured mechanically.
(*b.*) Give *four* examples, *not in the Physics primer*, of (i) energy in action, and (ii) energy in repose. How is the latter to be measured?

V. Describe two simple methods by which you might estimate the velocity of sound in air.

Part II.

VI. State as clearly and as fully as you can the various reasons for the selection of *mercury*, in the construction of (i) the barometer and (ii) the thermometer.

VII. (*a.*) If each of the following—copper, mercury, water, air—were raised in temperature by 100° Centigrade from an original temperature of 1°C., what would be the approximate amount of expansion resulting in each case?
(*b.*) Give a general explanation of the physical principle underlying the facts brought out in your answer.

VIII. (*a.*) Describe experiments by which you might compare, in a simple way so as to illustrate the subject, (i) the specific heat of water with that of mercury, (ii) the latent heat of water with that of steam.
(*b.*) Give approximately a numerical estimate of these.

IX. If I fan myself, I feel cooled in consequence; if I take a thermometer and fan it, I find there is no fall of its temperature. Explain clearly the physical reasons of the apparent contradiction.

Friday, 19th December, 2 to 5 P.M.

GEOGRAPHY, PHYSICAL AND GENERAL.

Examiners. { W. H. Wilson, Ph. D. / C. W. Pearce, Esq. / C. C. Flanagan, M.A.

The Answers to Parts I, II and III must be written in separate books.

Part I.

I. Describe briefly the various causes at work in altering the distribution of land and water on the surface of the Globe. Give any Geographical evidence in illustration.

II. Of what substances does the atmosphere consist; which of them are constant and which variable in quantity; and what purpose do they severally serve?

III. What is dew, and what conditions are favourable for its deposition? What is the *dew-point*?

IV. Among the most marked of the properties of water are:
i. A high specific heat.
ii. A high latent heat, in the condition both of liquid and gas.
iii. The increase of volume on passing from the liquid to the solid state.

Point out how these properties of water are instrumental in moderating the action of the forces tending to alter the physical condition of the earth's surface.

Part II.

V. Three men start from Madras. The first wishes to go as quickly as possible to Delhi *via* Bombay and to return *via* Calcutta. The second wishes to go by the most expeditious route to London and the third round the world to London *via* New York. Mention in as few words as you can, the course each would take, the mode of locomotion and the *chief* places at which each would respectively stop.

VI. (1). Name five peninsulas in America.
(2). Name five capes in the South of Asia.
(3). Name five rivers that flow into the Pacific Ocean.
(4). Name the portions of land that are separated by the straits of Magellan, Sunda and Macassar respectively.

(5). Name the lakes that lie in the basin of the St. Lawrence.
(6). Name the three principal groups of islands in the West Indies, with the names of four of the largest islands.
(7). Name four of the highest peaks in the Andes.
(8). Name the largest fresh water lake and the largest salt water lake in Asia.

VII. Where and what are the following and for what is each respectively remarkable:—Khatamandu, Trincomalee, the Megna, Mandalay, Shillong, Saigon, the Gobi, Valparaiso?

VIII. Where is New South Wales? What is the name of its chief town? Mention the other British Colonies in the same island with their capitals.

Part III.

IX. Define Plateau, Volcano, Republic, Loch, Fiord, Delta, Geyser, Bay and give one example of each (mentioning its position) either in Europe or in Africa. What are the tablelands of South Africa called?

X. The following are all in Europe. Give the name and position of each.

(1). A plain remarkable for its fertility.
(2). A peninsula that stretches in a different direction from that of nearly all the other peninsulas.
(3). A sea that is salter than the ocean and two others that are not so salt.
(4). A river which is a little shorter than the Indus and a little longer than the Ganges.
(5). A small island, about equally distant from two larger islands, and which has a government of its own.
(6). Two towns in the same country, one in the north of Europe and one in the south-east, connected by water communication.
(7). A group of Islands celebrated for a breed of ponies.
(8). Two countries, till lately tributary, but now independent.

XI. Draw a map of England marking the chief rivers that flow into the German Ocean.

XII. What is meant by latitude and what by longitude? A line, 30 degrees east of Greenwich, is drawn on the map, from the north pole to the south, entering Europe not very far east of the north Cape and leaving Africa at about the southern extremity of the colony of Natal. Before reaching Africa, it passes over a fiord, two seas, and at least two large rivers. In Africa, over two large rivers and two large lakes. Name these—What capital city in Europe and what large town in Africa will it pass near?

WHAT ENGLAND HAS DONE FOR INDIA.

Dr. W. W. Hunter, C.I.E., Director-General of Statistics to the Government of India delivered a lecture last night to the members of the Philosophical Institution, Edinburgh, on the subject "What the English have done for the Indian People." After premising, in regard to our relations with the East, that what we had reason to fear was not the cry of "Perish India," but the cry of "Perish the responsibilities entailed upon us by our rule in India," he remarked that if as some alleged we had failed to benefit the Indian races he could sympathize with those who questioned whether we should continue to accept or to entail the responsibilities which Indian rule involved, for no Government had a right to exist which did not exist in the interests of the governed. The test of British rule in India was not what it had done for ourselves but what it had done for the Indian people. If our attempt to administer that vast and distant Empire had turned out a failure, if its people were not more free, more secure and more prosperous under British rule than they were under their native dynasties, then the wise course for Great Britain would seem to be to curtail her former responsibilities, to accept no new ones and to withdraw, as far as might be, from the undertaking to which she had proved unequal. If, on the other hand, British rule in India meant order in place of anarchy, protection in place of oppression, government by the law in place of misgovernment by the sword, and a vast free people dwelling in safety, where of old each man was beaten down beneath whosoever was stronger than himself, then he thought Great Britain might with a firm heart continue to accept the great responsibility which had fallen to it, and calmly face the duties that responsibility involved. After remarking that during the last ten years it had been his business to visit almost every winter the twelve provinces of India and superintend a survey of their population and resources, Dr. Hunter said he had often amused himself in imagining what a Hindu of the last century would think of the present state of his country if he could revisit the earth. After he had got accustomed to the fact that thousands of square miles of jungle had been turned into thickly peopled crop lands, that fever-smitten swamps had been covered with healthy and well-drained cities, that the mountain walls which shut off the interior from the sea had been pierced by roads and spanned by railways, and that the great rivers which formed the barriers between provinces and desolated the country with their floods had been spanned by bridges and tapped by canals, he would note as even more surprised than these outward changes the security of the people; the fact that the multitudinous Native States which used to be in a condition of jealous isolation, broken only by merciless wars, were now trading quietly with each other, bound together by railways and roads, by the post and the telegraph; and the appearance all over the country of hospitals, schools, and courts of justice. Proceeding to present a few scenes of the panorama which India would offer to such a visitor, the lecturer commenced with a glance at the frontiers of India in the last century. While guarded along the whole length of its boundaries by mountains and the sea, it had at its north-eastern and north-western corners two sets of gateways which connected it with the rest of Asia. Through these successive hordes of invaders

had poured into India, and in the middle of last century six such invasions on a great scale occurred in twenty-three years, such invasion signifying not merely a host of from 20,000 to 100,000 barbarians on the march, paying for nothing, and eating up every town and cottage and farm-yard on the way, burning and slaughtering on the slightest provocation, and often in mere sport, but also a grand final massacre at the capital of the invaded country. In the first of these six invasions, led by a soldier of fortune from Persia, 8,000 men, women and children were hacked to pieces in one forenoon in the streets of Delhi; while the five Afghan invasions which followed formed one of the most appalling tales of bloodshed and wanton cruelty ever inflicted on the human race. During these years, the border land between Afghanistan and India lay silent and waste; indeed, districts far within the frontier which had once been thickly peopled and were now again thickly peopled swept bare of inhabitants. The Afghan question survived to this day, but its present form, although by no means easy of solution, was preferable to the shape in which it presented itself in the last century. That question had now passed beyond the range of purely Indian politics, and must be decided by the deliberate voice of the British Parliament. British officials in India were neither Whigs nor Tories, but simply a body of administrators doing their best to govern an Asiatic country without reference to European politics and in the interests of the people themselves. The task, in its present dimensions, was a sufficiently vast one, and so far as he might speak for those officials he should say that neither did they desire annexation nor did they shrink from the responsibility which annexation, when necessary, involved. It was for the British nation not for their Indian servants to settle the future of Afghanistan; but if the nation resolved that Afghanistan was to cease to be a turbulent neighbour, and that she was to become henceforth a well-ordered part of the Indian Empire, then the past history of that Empire showed that there would be no permanent difficulty in giving effect to that decision. British rule had taught more unruly, more numerous and far better organized races than the Afghans the lesson of settling down into peaceful industry. That lesson was not to be taught in a single year, and both teachers and learners might make some serious mistakes at first; but the task of dealing with Afghanistan was one of less magnitude than the task of dealing with the Punjab was thirty years ago. If Great Britain decided that a similar course was to be adopted in Afghanistan as was adopted in the Punjab, the same results would follow. Indian soldiers had again proved that they knew how to conquer, and Indian administrators would again show that they knew how to govern. The mass of the Afghanistan people, no longer ground down by the military clans, would find that a new era of prosperity and security had begun; while before ten years were over, the military clans of Afghanistan would pride themselves, as our late enemies the Goorkhas and the Sikhs now did, on supplying the best disciplined and most loyal regiments to our Indian Army. Another frontier people would be added to the long list of wild races who had turned their spears into pruning-hooks under British rule. In the last century, Dr. Hunter proceeded to remark, invasions were yearly events along the whole frontier of India. The Himalayas formed a line of fortresses from which the hill races poured down

upon the plains, and for more than 1,500 miles along their foot stretched a thick belt of territory which no one dared to cultivate. On the north-eastern border, again, the history of the fertile valleys of Assam was one long narrative of invasion and extermination. The great mountain wall round Northern India failed, therefore, till the British came upon the scene, to afford any security to the Indian races. The sea, which formed the natural defence of the rest of the country, was in like manner only a source of new dangers being infested by pirates who burnt the villages and massacred or carried off into slavery the inhabitants. This state of things could not be permitted under British rule, and the first business of England was to secure India from foreign invasions. The sea robbers were effectively dealt with and the Indian waters rendered as safe as the English Channel. The subjugation of the unruly tribes of the Himalayan frontier took a longer time and was less complete, as our troubles with Afghanistan attested. But by persuasion, and when necessary by chastisement, we had taught the wild races along the whole north-eastern frontier, for a distance of 1,500 miles, that they must keep quiet and betake themselves to some other livelihood than the pillage of the husbandmen on the plains. Most of them had been apt scholars. The great kingdom of Nepaul, on the north, which forced us to correct its inveterate practice of raiding by two campaigns, followed by partial annexation, had for the last sixty years been our firm ally. Other Native States, like the Principality of Cooch Behar at once settled down into peaceful industry, its first and only treaty with us, dated 1773, remaining unbroken by their party of this day. A firm frontier being established, the peasantry spread themselves out upon the fertile depopulated lands. The task of reclaiming those tracts had been a heavy one. In some parts, as in the now populous district of Goalpara, more money was spent until twenty-five years ago by Government in rewards for killing the wild beasts than the whole sum realized from the revenue. While the natives of India had pushed their rice cultivation towards the foot of the mountains, English capitalists had dotted their slopes with tea plants. Not less than 13,000 square miles of this border land had been reclaimed, and yielded each year sixteen millions sterling worth of food, the tea gardens alone exporting last year three millions' worth of tea, chiefly to England. They had heard a good deal about a scientific frontier for India. He was not going to say a word on that vexed subject, but it would be well to realize the meaning of an unscientific frontier in India. The unscientific frontier of the last century suggested that 60,000 square miles of border land were abandoned to jungle and wild beasts, not because there were no people to cultivate the soil, but because they did not dare to do so. An unscientific frontier signified a tract which might have yielded thirty millions sterling worth of food each year lying untilled through terror of the turbulent hill races. The improvement effected by a century of British rule in this old unscientific frontier meant that 13,000 square miles had been brought under the plough, yielding each year sixteen millions' worth of food, or more than the whole cost of the Indian Army and of the defence of the Indian Empire. But the task of freeing India from foreign invasion was not the only responsibility which the acquisition of the country entailed. The dying throes of

the Mongol Empire had let loose its disbanded and revolted armies upon the people, and the troops lived by open pillage. The miserable peasants, stripped of their little hoards, were forced to become plunderers in turn, and in 1772 it was reported that organized gangs of robbers were burning, plundering, and ravaging the interior districts of Bengal in bodies of 50,000 men. The English found no police in India to cope with this great evil. For a time the East India Company's troops were constantly engaged against the banditti, but by degrees the robber bands were broken up and scattered themselves over the country in small gangs. Lawlessness has been the normal condition of India for at least 100 years before the advent of the British, and a great organization of the criminal classes had existed from time immemorial, which had to be put down without the aid of any regular police. At first the company's servants attempted to extirpate crime by copying the cruel criminal code of the Mussulmans, and the gang robbers retaliated by inceraliarism on a great scale throughout the country. All this, however, had changed. There was now only about one-third of the crime in Bengal that there was in England. While for each million persons in England and Wales there were 870 criminals always in gaol, in Bengal, where police was very completely organized, there were not 300 convicts in gaol for each million; and while in England and Wales there were 340 women in gaol for each million of the female population, in Bengal there were less than 20 women in gaol for each million of the female population. The use of troops against banditti was now a thing of the past, and the existence of an army was less realized in a rural district of Bengal than in an English shire. A century of British rule had, therefore, not only secured the Indian frontier from invaders, but had freed the interior from banditti. This triumph of good government had been achieved partly by legislation and partly by police. The English in India recognized that they had a special class of crimes to deal with, and they framed a special department of criminal law to put those crimes down. After illustrating this with reference to the Dacoits and Thugs, and referring to the trouble still given in recently annexed parts of India by the old predatory clans, the lecturer went on to say that a well-paid and highly-disciplined police now dealt efficiently with the small amount of crime still existing in India. The old criminal tribes found it more profitable to be on the side of law than against it, and sought employment as detectives or housewatchmen. Touching next on Indian famines, Dr. Hunter said this was now recognized as one of the most difficult problems with which the Indian Administration had to deal. A hundred years ago a failure of the crops confined to a single district and involving the starvation of a few thousand families, or entering a province or a still wider area and occasioning the death of hundreds of thousands or millions was accepted as something natural and inevitable. Even as late as 1837 famine was practically regarded as beyond the help of man, and the famine of that year left behind so terrible a memory that to this day the peasants employed it as an era by which to calculate their ages. After sketching the horrors of a famine in the last century which entailed the loss of about ten million lives, and mentioning that in that terrible summer of 1770, only £9000 was distributed to aid the starving population of Bengal, Dr. Hunter called attention to the fact that in the Bengal scarcity

of 1874 the British Government spent close on four millions and in that and the five following years devoted over fourteen millions to feeding its people. Here, he said, was one great difference between the last century and the present; but it was by no means the most important difference. In the last century neither Government nor people thought it possible to deal with a great Indian famine. In the present century famine had been brought within administrative control. A vast organization of preventive and remedial agencies was constantly kept in readiness to deal with the periodically recurring dearths. Canals, irrigation works of many kinds, railways, roads, and every improved form of modern communication, together with State charity in India and the munificent benevolence of the British nation at home, were the weapons with which the Indian Government now did battle against famine. Depopulation from any cause was now unknown. In the last century various causes of depopulation were at work; the quick-growing jungle spread over the deserted land, and fierce beasts were the undisputed lords of fertile tracts. As the rural communities relinquished their hamlets and drew closer to the centre of a district, the wild beasts pressed hungrily in their rear. In vain the East India Company offered a reward for each tiger's head sufficient to maintain a peasant's family in comfort for three months; in vain it spent the whole land revenue of a frontier district in rewards for killing wild beasts. Tigers, leopards and wolves slew their thousands of men and their tens of thousands of cattle; but the wild elephants were absolutely resistless, lifting off roofs, pushing down walls, trampling a village under foot as if it were a city of sand. In two parishes alone during the last few years of the native administration fifty-six villages with their surrounding land had been destroyed or gone to jungle through the depredations of wild elephants. All this was now changed. One of the complaints of the modern Englishman in India was that he could so seldom get a shot at a tiger; wolves had disappeared. The wild elephant was now so rare that he was especially protected by the Government, and in many parts of India he could only be caught by official license or under official supervision. Many districts had petitioned for a close season, so as to preserve the edible game still remaining. The only animal that had defied the energy of the British official was the snake. One might, however, judge of the loss of life by wild beasts in the last century from the deaths caused by this their sole survivor at the present day. The ascertained number of deaths from snake bite in 1869 exceeded 11,000, and it was estimated that 20,000 persons annually died in India from this cause. The total deaths from wild beasts in the last century was probably not under 150,000 a year. Dr. Hunter concluded by briefly recapitulating the improvements he had described as a few of the outward and visible results of a century of British rule in India, and intimating that on Friday evening he should examine some of its less obvious, but equally important, consequences. They should find, he said, that great as was the success which their countrymen had won in establishing peace and security throughout the provinces of India, they had accomplished a far more difficult task and won even more glorious results in the social emancipation, the industrial development, and the moral enlightenment of the people. The lecturer was frequently applauded.—*Times, November* 22.

"INDIRECT INFLUENCES."

I.—NATURE AND SCIENCE.

WHEN I began to think over the title, I was rather appalled at the nature of the subject. The whole world seemed to resolve itself into a system of indirect influences—the world of nature, the world of science, and the mind of man; indeed, you may ask yourselves why, as there are so many direct influences, I did not address you on that subject. Well, direct influences are obvious—they assert themselves; but indirect influences are more subtle and most fascinating in their character when you begin to follow them up, whether they be traced in the mysteries of nature, the discoveries of science, the researches of philosophy, or the windings of the human heart.

You are warmed by the present heat of the sun. That is direct; but when you light your fire you are using a power that has been stored up for countless ages in the bowels of the earth. It is bottled-up heat—the heat rays of sunshine that illumined the earth long before man appeared upon the face of it—which now glows in yonder stove full of coals. And so water may have a direct influence to quench your thirst, but when water is acted on by heat, converted into vapour, or recondensed, it affects in a thousand indirect ways the face of Nature. The habits of man modifies climate, and makes all the difference between life at the North Pole and life in the Tropics. And so of air. You use it to breathe, or as a mechanical force in pneumatic pressure, but air indirectly is the subtle cause of disintegrating all living and dead substances, or of wafting the sporadic seeds of contagion and death throughout our densely populated cities.

I pass from nature to the sciences. The whole application of science is one long illustration of the force of indirect influences. We discover generally too late what dangers lurk in the neglect of indirect influences; what powers are within our reach to use or to waste; what unsuspected stores of force; what hidden engines of destruction. The science of political economy may be called the science of indirect influences. It is an obvious fact that when a window is broken some one has to pay for it. The glazier sees that, and says it is good for trade, for when a window is broken the money comes into his pocket. This is what he sees; but what he does not see is, that the man who pays him the money has lost that amount, and so cannot pay it to some other tradesman, or devote it to a purpose more satisfactory to himself. The broken window is not good for trade. It puts money into one pocket instead of another, but the dead loss is what the glazier does not see. In fact, the breaking of the window has done nothing but inflict a dead loss on the community, but to the glazier that is a most indirect influence. The whole application of the sciences is an illustration of indirect influences. Indirect influences have changed the face of modern civilisation. The printing press, steam, and electricity, through altogether recent modes of manipulation, have revolutionized arts and commerce and all modes of manufacture. They have bound distant continents together, and created the solidarity of empires. They have multiplied the arts of peace, and recreated the science of war; and the meditations of the philosopher, the chemist, the geologian, and the student of comparative philology, have exercised a very important influence in remoulding fundamentally our religious conceptions. I say religious *conceptions*—for religion cannot be altered. The essence is the *same* yesterday, to-day, and for ever. All religious concepts are so many gropings after the spiritual and universal fact which underlies them.

II.—IMAGINATION.

Then pass from the sciences to the mind of man itself. Think of the indirect influences of any one of its faculties. Take such a thing as *The Imagination*. We are a practical people: sometimes we disparage the value of what we call fancy or imagination, but we must not esteem that poetic faculty too lightly. It belongs to the higher level of our being. The toiling man of the world is sometimes better for entering into that sphere, and whenever we are highly excited we unconsciously isolate topics, investing them with new attributes and intense glow. We enter in all moods of affection, love, worship into the powerful realm of imagination. Indirectly imagination touches at times life at all points, and is often seen to wed its opposite. Think of imagination and science—fancy and mathematics, or imagination and history—fancy and fact, or imagination and geographical discovery. What can these things have to do with each other? Indirect influence will show you.

Sir Benjamin Brodie, and after him Professor Tyndall, have often asserted that some of the greatest scientific discoveries have been due to the imagination. Galvani, by noticing the movements of a frog under abnormal excitation, leaped to certain conclusions or working hypothesis, and, drawing upon his imagination, first stumbled upon the truths of galvanism. Newton, meditating abstractedly upon the fall of an apple, hit upon the law of gravitation; and I have heard Mr. Tyndall point out how very closely akin are the modes in which the poet conceives and executes his work to those moods of the laboratory in which the scientific man ponders not only upon the facts that are before him, but the causes of them, and, through the imagination, upon the effects which those facts are calculated to produce under widely different circumstances. The isolated facts require some mystic touch of superior power to bring them together—to 'focus' them; it is then that mind acts with a kind of preternatural activity, then the scientific imagination comes into play, and the man begins in *something like the intense* heat and light of poetic creation to be touched and visited by the inspiration of hypothesis which are afterwards justified by explaining so many facts, and which are indeed the very *pivots upon* which scientific discovery turns.

In history we have dry facts; but then the dry facts are not history, any *more than isolated phenomena* constitute science. History, to be written and understood, requires the aid of the imagination to bring its scattered fragments into a connected and truly historical narrative. If I want to know the biography of a man, and you tell me that on the 4th of November Jones went to Brighton, put up at an hotel and had his dinner there, and after dinner smoked his cigar on the parade, I do not know any more of that man, and I do not care to know any more about him. Any number of dry facts do not mean much until they are correlated, explained, and their interdependence at least hinted at. But if you tell me that Jones

was in love; that he went down to Brighton fully hoping to see the object of his affections; that finding her absent he returned to his hotel; but although he had ordered his dinner, owing to the state of his feelings, he had no appetite; that, his mind filled with melancholy thoughts, he walked out by the sea, and, taking out a cigar, &c.,—Jones begins to come together. The biographer, by his sympathetic imagination, creates a probable hypothesis for Jones's conduct, which, as it accounts for the facts, convinces us of its truth. Jones ceases to be a lay figure and begins to live.

And when you come to past history you require the historical sense, which, raised to its highest power, is a rare form of imagination, irradiating and arranging facts, and telling you what they mean. In proportion as the facts are connected satisfactorily we catch the truth we seek for, and all good modern history is closely wedded by indirect influence to the imagination. When a man like Macaulay, or Froude, or Green, who knows what to do with his facts, writes a history, and when you read those facts in their new setting they begin to live, and the period before blank or obscure glows with colour, and fills out with harmonious proportions for the first time. I remember very well M. Ernest Renan not long ago saying to me in Paris that the first centuries of Christianity possessed for him an absorbing interest, because, with an increased knowledge of language, geography, and historical documents, we were now enabled for the first time to put together with some show of probability the materials of the Four Gospels, and the origins of that wondrous fabric, or rather that organic growth—the Christian Church. "C'est interessant de s'imaginer," he said, "comment tout cela a peut se faire." M. Renan has realised his conception with the accuracy of a statistician and the eye of a poet in that splendid series of *origines* consisting of the "Vie de Jesus," which contains much that I regret, and is certainly inferior to its brilliant successors—"Les Apôtres," "St. Paul," "L'Antichrist," and "Les Evangiles." For an incomparable history of the Roman Empire under Nero let me invite you to select for your perusal "L'Antichrist." There is no finer example of the way in which the oblique rays of the imagination may be used to play upon and irradiate the facts of history.

To turn to Geography. We say that Columbus discovered the New World by calculation and experiment; he had his maps and charts, &c., and then he set off in the right direction. Yes, but these alone would never have enabled him to get there had his mind not become possessed with the idea that kept filling itself out; in his dreams he had seen the new land long before he started. Had he not drawn upon his imagination where would have been the ardour, the perseverance, that bore down all opposition, incredulity, and ridicule? In addition to the hard facts we want a certain sympathetic influence to give us the courage to execute things which we know can be done, as when Ulysses, addressing his faithful crew, exclaims—

> "My purpose holds
> To sail beyond the sunset and the baths
> Of all the western stars until I die!"

And so Columbus seemed to his affrighted crew to sail beyond all conceivable landmarks—in his imagination alone arose the shining

coasts that beckoned him on to a new world. And, believe me, there is not a Goth or a Vanda over whom a certain rude imagination has not held its sway. As the waves of successive emigration came rolling on from the remote tableland of the Hindu Kush it was upon eager expectation that the people fed, just as Cæsar's people sat down on the beach to open the British oyster. *Spe margaritarum.* And through those periodic invasions of northern Italy by the Germanic hordes, it was not the narrowness of their own forests, nor the pressure of neighbouring tribes, nor even the hope of plunder alone, but the fair plains and marble cities of the sunny South that rose before the dazzled imagination of the hardy savage on the other side of the Alps. Yes; and the merchant at his desk, and the tradesman behind his counter, and the intelligent boy at school—all these are assisted by the indirect influences of the imagination, and they all conjure up their dreams of the future. The clever boy over his books thinks of the time when he will win an honourable position for himself; the hard-worked clerk or young schoolmaster sees in his mind's eye his future home, with the young wife who will share happiness and economise the results of his toil, and the fireside of that bright home which he hopes one day to make for himself beckons him on. It is the same with the struggling artist, who labours through long years of neglect in a back attic. He sees himself already the possessor, in imagination, of one of those splendid studios which are dotted over the region of St. John's Wood or Camden Hill, and he looks forward to the day when crowds will rush to catch a glimpse of his last great picture, as it hangs on the walls of the Royal Academy. There is many a poor man who has been thus buoyed up, until the force of his fancy has worked itself into reality, and his name has been in every one's mouth, and showers of gold pour in upon him. These results have often crowned the exercise of the imagination, and its indirect and smiling influences have enabled such workers to face the toil which was absolutely necessary to ensure the final success.

III.—Character.

But if we are acted on by these various influences, it is in order that we may react favourably upon others. We are all centres of influences. Our moral atmospheres exhale themselves whether we will or not. You cannot tell, when you enter into any company, to what extent you may exert influence. Your looks, your ways, your words, all have their effect upon those who surround you. You remember the memorable occasions on which you have been brought into contact with those "Souls who have made your souls wiser" (Emerson). But the work has often been most subtle and indirect, and, although you may not have spoken, or even been personally spoken to, yet something you have lost or gained, priceless or irreparable. But remember this, that our influence depends, not so much upon what we *know*, or even upon what we *do*, as upon what we *are*. It is very important to teach children to know, and more important that they should be trained afterwards in technical detail, but it is most important that they should be taught to *be*. And you may teach them knowledge and action, but you can never teach them how to *be*, unless you yourselves *are*; and you should never stop short in your double process of self-culture, of knowledge which is

power, and of that action which is the result and realisation of power, but go on to possess yourselves of that most important influence which I may describe as the solid golden crown of life—*human character*. A man should be solid and firm all through. Let us see that a man is not shaken to pieces by temptation; let us see that his faculties are so annealed and fortified that they will bear the test of trial. It is this sort of character that tells upon the world, and which has the most powerful direct and indirect influence upon man, woman, and child.

Now, character depends upon *principle*. We mean, by a man who is high principled, one who has a certain conception of human life based upon duty and honour and a just sense of his responsibilities, a conception under which may be ranged any number of rules for the conduct of life. It is sometimes the fashion to laugh at principle, but it is a very shallow jest. I dare say you will remember how, a few years ago, people took to laughing at political principles as it suited their purpose and they can do so still. We heard a good deal about the absurdity of "blazing principles" when a certain Government, you will remember, came in on the heels of another Government. The Government that went out had wanted to pass measures of reform, but the Opposition said they were too extreme, and that the country was not prepared for them; and so Mr. Gladstone's Government had to go out. Directly the Opposition Government came in it passed far more sweeping measures, and then it was that a section of the press called attention to the glaring inconsistency, and began to hold things up in the light of "blazing principles." Then it suited the Government organs to sneer at "blazing principles." England did not want them; we wanted practical action. The doctrine of accomplished facts hustled "blazing principles" off the political platform. We were told to come out of Utopia and live in a work-a-day world, and so on. Well, we are not here to discuss politics, but you may depend upon it any steady violation of principle will at last have a ruinous effect upon political and every other fair fame. It may succeed for a time, but it is only a *veneer* of success, and not the deep reality. A policy without principle is a rootless tree in a rocky soil—it shall never push forth a green shoot. "Every tree which My Heavenly Father hath not planted shall be rooted up."

We may laugh at blazing principles, but, in the long run, nothing but principle wins at all, and that is why I take a solemn joy and delight in seeing anything like a great humbug upset—some mask that has been imposing upon the world for years. I say I like to see that man exposed, and made to feel very much on the wrong side of "blazing principles." Most of you, no doubt, can recollect a large mansion which was reared not far from the Albert Hall. I remember hearing that the creditors of the man who raised that mansion said he should never get into it; and he never did. And when we see those bubble companies burst, it is with what Thackeray calls "a deep and abiding" satisfaction, and, just as one's indignation is directed against these unprincipled impostors who flourish like green bay trees, so when you look at the lives of men who believe in principles and stand by them through thick and thin, and are no more blinded by immediate success than by the absence of it, you feel the spectacle is ennobling.

By Rev. H. R. Haweis, M.A., Incumbent of St. James', Marylebone.

THE LOVE OF KNOWLEDGE.

I SHOULD like, to point to two ruling principles which are of universal importance, but which may, perhaps, have a peculiar interest for teachers. The first principle is the "Love of knowledge for itself;" that is a mental principle. And the second is a moral and spiritual one: it is "The love of enthusiasm of humanity for itself." These form powerful centres for diffusing heat and light, and they are amongst the most mighty of indirect influences. The man who has not a love of knowledge for its own intrinsic worth never can be a successful educator. Education does not mean stuffing a lot of matter into the brain; it means, from the very nature of the word, bringing out what is there. Before you can draw out what is in a child, of course, you must teach him how to use his powers; but that is not done by cramming, but by development. You are there to develop—to draw out of him what he is—that is education. But educators must be educated. The question then becomes primarily one of self-culture. And here is food for many addresses instead of a closing paragraph. One good rule is, "Know more than you use"—read and think outside and all round. Lord Brougham used to say, "Know everything about something, and something about everything." And here some one mutters he has no time. "No time" is often given as a plea for the neglect of extraneous knowledge. To a certain extent this may be true, for some take twice as long to do a thing as others. But every one should find time to be untechnical—out of routine, and to cultivate knowledge for its own sake. You had better even be imperfect in some parts of technical education, and have time to know that which [illegible] a worse crammer but a better educator. [illegible] the [illegible] men, not educators, not busy men, who [illegible] time. [illegible] the idlest men I ever knew was always pressed for time, could not speak to you for a minute, was always in a hurry, and was always too late. It is the really active-minded, busy people who can find time for everything. Bacon, though Chancellor, had time to found modern science; Herbert Spencer, though I believe holding an arduous Government appointment, has had time to inspire half the philosophy and metaphysics of the age in that masterly series of works beginning with "First Principles," and of which the essay on "Ethics" is the latest instalment; *Judge Grove has* had time to produce the "Correlation of the Physical Sciences;" Creasy, an active barrister, was a voluminous historian and essayist; Sam Warren, a brilliant novelist; Lord Beaconsfield produced his novels when actively engaged in political life; and when you come to Mr. Gladstone you come to a man who can write on any subject with equal fluency—"de omnibus rebus et quibusdam aliis"—therefore, I repeat, the excuse of "no time" ought to weigh with no true educator. You may find leisure for some artistic or musical pursuit, some horticultural or mechanical study; you may take up some branch of science; you may apply yourself to history. And as to science, I do not think it is calculated, as some suppose, to make men atheists: on the contrary, each new discovery seems to me to impress one more with the height and depth of wonder and mystery, and the infinite resource of the Divine mind. Puzzle as you will about atoms—take about sixty-three different kinds—you are obliged to slip in mind somewhere

before you can get the required phenomena out of them. As Mr. Tyndall says, you must change radically your ideas of matter, and then you can get the promise and potency of all life out of it—*i. e.*, you must put into matter what you want to get out of it. It is the old hat trick—a regular cornucopia of wealth. "Causality," no doubt, if it were but conceivable, would explain everything; but is "causality" anything but mind immanent in matter? Materialism presents life and mind as the outcome of matter and force; Spiritualism (not table rapping) presents life and mind as immanent in or regulating both matter and force. Materialism places mind at the end and calls it man; Spiritualism places mind at the beginning and calls it God: and there God will assuredly still be found by those who seek Him. The earnest student of science is led up from the effect to the infinite cause, and the details of his study and experiment are of the most ennobling and fascinating character. You will find in the popular works of Huxley, Tyndall, Lionel Beale, Faraday, Bain, and Proctor, and L. Figuier, abundant scope for your scientific leisure hours. And let me recommend a little 5*s.* box invented by Dr. Gladstone for the conduct of a large variety of simple experiments in earth, air, fire, and water.

With regard to the study of History. Many have an objection to the long histories—they cannot wade through them; but, believe me, no *resumé* or analysis is to be compared with the large histories. They take time, I know, but the diligent student is amply repaid for his trouble. To those who are fond of history, I cannot do better than recommend such *pièces de resistance* as Gibbon. It is a book which fascinates you the more you read it, and though it may appear dry at first, its beauties grow upon you as the landscape beneath the brush of the patient artist. I remember Alma-Tadema, the great painter, saying to me that he sat down every day at his easel. Sometimes he began without enthusiasm, and painted on with little interest. But after an hour or so he surprised himself in a fit of absorption—the fire had kindled within him as he worked. And it is so in reading: never mind the dulness—it will go off. You will get hold of Gibbon's atmosphere. Then the delight of dropping down upon a period you know something of from another point! So over Gibbon's Centuries, with Milman's History of Latin Christianity, which, as Macaulay truly says, is in some parts ill-arranged, but, in many biographical episodes, bright, picturesque, and, on the whole, careful, full, and masterly. Then turn to Draper's one-sided, birds-eye view of the whole "Conflict between Religion and Science," and correct your ruffled feelings by a careful perusal of "Lecky's Rationalism" and "History of European Morals," which are as friendly as Draper is hostile to Christianity. For an admirable construction of English History read "Green's Short History of the English People;" for special periods, Froude, Macaulay, and Carlyle's "Cromwell." For political structure, take Hallam; for episodical history, take Maitland's "Dark Ages," or Motley's "Netherlands," as it bears on England. For biographical history read such fragments as Michelet's "Luther," or Seebohm's "Oxford Reformers." Do not neglect Lingard because he was a Catholic historian; he is very learned, and smooth, and fair to the Reformation. Bagcot is admirable, and most concise as well as readable on the English Constitution. Pray do not neglect Mill's two incomparable essays "On Liberty" and "Representative Government," gems of style, and models of compact, luminous, and suggestive thought. Buckle must be read with caution—but I lose myself in these seductive by-paths.—H. R. Haweis.

THE TRAINING OF TEACHERS.

By the Rev. R. H. Quick.*

For almost every kind of labour except the lowest two things are needed,—first, knowledge; second, skill. On first view it might seem perhaps that in ordinary occupations skill is everything, but on reflection you will find that there is some knowledge to aid the skill, even where the necessary knowledge is but small. A cobbler must know about his tools and about his leather, though here the knowledge comes as a matter of course to the apprentice. The musician must know the import of musical signs, the painter must know the effect of mixing different colours. In all these instances, although the knowledge is simple and easily acquired whilst the skill cannot be obtained without long continued labour, and natural ability too in some cases, we find that the artist or the artisan must have both knowledge and skill.

There are indeed some arts, such as swimming, rowing, skating, in which skill alone seems required; and in these, though useful hints may often be picked up from books, the hints are not necessary, and knowledge of theory will give its possessor no practical advantage. But in strong contrast with these, we find a class of occupations in which, though much skill is required, a large amount of knowledge is no less essential. Perhaps the best instance to take of an art of this kind, is the art of surgery. This is, of course, an art requiring the very greatest skill, but this skill must be directed by a knowledge of the human frame, and of much besides; and although this knowledge cannot make up for want of skill, skill would often be worse than useless without the knowledge.

In arts of this kind there is reason to believe, that while the need for skill can never cease, the relative importance of knowledge will grow more and more. There are limits to possible skill, but there seems to be no limits to possible knowledge. When a great surgeon dies, his skill perishes with him, but his knowledge continues with his successors. Thus knowledge is ever increasing, whilst skill remains the same. Indeed, increased knowledge to some extent takes the place of skill, and with modern appliances the ordinary practitioner may perform operations which the most skilful surgeons of the olden time would not have attempted.

Not a few professions seem likely to be revolutionized by the constantly increasing importance of knowledge. Time was when the pluck of the English gentleman, combined with the knocking about he met with on actual service, was quite sufficient to make him a competent general of a division, or captain of a man-of-war. But this is the case no longer. Skill acquired in doing is by no means all that the officer in the army or navy needs now-a-days. The

* The four lectures, of which this is the first, were delivered for the Leeds Council of Education in the Philosophical Hall, Leeds, on September 24th, 25th, 27th, 28th, 1877.

importance of knowledge has so much increased that ignorance seems as fatal as cowardice. The French were as brave as the Germans, but they had not like the Germans made a scientific study of the art of war, and their ignorance was fatal to them. And in the East, thousands and thousands of brave men, both Russians and Turks, are being sacrificed to the ignorance of commanders who have not studied the effects of recent changes in the implements of war.

This increased importance of knowledge has already affected the training of our officers for both army and navy. They are now required to study theory as well as to get practice. Even the men are lectured, and the officers cannot rise high in their profession without very respectable scientific attainments.

This change in our army and navy is all the more remarkable, because we English are, as a rule, very averse to making a scientific study of our work. We value skill highly, but anything that smacks of "the bookish theoric" we distrust as tending to make not doers but talkers. This feeling among us has brought neglect of professional training to such a pitch, that till quite lately the preparation required for Holy Orders was a course mainly of Latin poetry and Greek plays, combined with cricket and boating; and the Inns of Court made no further requirements of candidates for the Bar than that they should have eaten a certain number of dinners in a particular place. But the times are against us. The race does not seem to be any longer to the swift, but to the runner who has studied the course and knows the shortest cut; so everything is changing, and we are at length seeking that knowledge which has been of such great advantage to the most prosperous nation of the Continent. The candidates for Ordination are required to know more than their Greek plays; young barristers have to submit to other tests than those of the digestion; and last of all, there is a growing impression that as the cane seems getting unpopular, the young schoolmaster should be provided with some sort of knowledge to act as a substitute for it.

This impression, however, is still a vague one, and shows itself only in inquiries and discussions and general discontent. And before anything effectual can be done towards the establishment of a system of preparation, a vast amount of prejudice must be overcome. Many years ago a distinguished schoolmaster (Professor Pillans) in his old age, proposed giving a sum of money to found a professorship of the Science and Art of Education. He accordingly went to see the Educational Minister of that day, a day when the Liberals were in power, and novelties should have at least received unprejudiced consideration, if not a cordial welcome. But the Liberal Minister looked on the Professor as one of the troublesome class whom De Morgan has dubbed "paradoxers," and gave him a cool, indeed a barely courteous reception. The Minister announced that there was no such thing as a science of education, and still more, that there could not, and should not, be such a thing. A professorship of education would be an absurdity, and worse, so the Government would not countenance the scheme. Whatever we may think of Mr. Lowe's wisdom, we must admit that he was consistent and straight-forward. The present Government show a change of opinion in the subject, but they have only got as far as the stage of inconsistency and vacillation. About three years ago they promised a

grant of £400 a-year, which with a similar grant from the Bell Trustees would maintain two chairs of education in Scotland. But somebody espied terrible dangers likely to result from the appointment of two gentlemen to lecture on education, and this strong Government, though it gave the promise, has not had the courage to keep it.

We find, then, that there is a prejudice against any professional preparation of the schoolmaster. Teaching is not recognized as one of the occupations where knowledge is needed as well as skill.

But professional preparation of teachers already exists among us. For the last thirty or forty years we have had colleges for elementary teachers, and the trained teachers are so successful that they often cannot be kept in the elementary schools for which they were prepared, but rise to posts in secondary schools where they get less work, more pay, and are set free from some social disabilities. And yet successful as they often are, these teachers are sometimes pointed out as a warning, rather than as an encouragement to make learning universal.

Let us see what objectors have to say on this subject. I was once present at a discussion in which one of the ablest headmasters in the country expressed himself somewhat as follows:—

"I must say I am profoundly sceptical about any benefit to be derived from training. What is the use of lecturing beginners *about* teaching, when they do not know what teaching is? We learn a good deal by discussing scholastic matters among ourselves, but we could learn nothing if we had not been teaching for years, and thus gained the experience which alone can make such discussions intelligible to us. So much for lectures; and as for the system in the training colleges, I believe it often does more harm than good. Among my assistant masters I have had some first-rate trained masters, and these men at the beginning of their time with me were far more successful than men who came straight from the Universities, but I doubt whether in the long run the school was so much benefited by them. In their method of handling their subjects there was a mechanical completeness which had a very deadening effect. Whatever the thing was, they had it all at their fingers' ends, and went through it with the regularity of clockwork. The consequence was that when they had been over a subject one had a feeling that the thing was done with; one never wished to hear of it again as long as one lived. Thus there was no growth in the knowledge they implanted. It did not, in the least, inspire the desire for further knowledge. An intelligent man from the University might at first seem a mere bungler by the side of the trained master, but the boy's minds were in the end more awakened by him, and there was all sorts of growth in the man himself; he did not come to the school finished off like the trained teacher. Then again, not only in handling his subject, but also in the management of the boys, the trained master seems much better than he really is. He attaches vast importance to class drill; but in my opinion, really good, inspiriting teaching is impossible so long as we maintain what the trained master requires in the way of order; and, on the other hand, I have found a good deal of seeming laxity of discipline (laxity that no trained master would dream of tolerating) in the classes of the very best teachers I ever knew. I think therefore that as the

sailor is best trained at sea, so the schoolmaster is best trained in the schoolroom; and if he enters it with an active mind, and with general interests, such as are fostered by the Universities, he is all the better for not having been subjected to an artificial system of training."

Thus far my objecting head-master, a man for whose opinion I have the very highest respect. I listened with the greatest interest, and felt then, as I do now, that there was much force in what he said. But let us consider whether he put the case against training quite fairly. I believe there is no body of men in the country who are more entitled to our respect than the elementary schoolmasters; and considering the difficulties they have to contend with, I maintain that their work proves the value of the training they have received. But if they have had the advantage of professional training, those with whom my objector compares them have had their special advantages, which must not be lost sight of in the comparison. The trained master has spent most of his boyhood, not in intellectual pursuits, but in teaching children. This occupation for boys between the ages of thirteen and eighteen, may, and no doubt does, give considerable power of managing classes, but it is not favourable to intellectual development. At the training colleges is acquired, not so much the knowledge of education as a science or an art, as the knowledge of the subjects which must be taught. Of course, I do not mean that no professional knowledge or skill is given, but that the *main* employment in learning just what the students would have learnt by the age of entrance if they had been under instruction instead of having taught up to that time.* At the end of his two years at the Training College, the young man comes forth a trained master. His rival from the University has spent his whole youth, or at least the best five or six years of it, in learning of cultivated masters, and then has had this teaching continued for three years more by the ablest men at the University. When teachers of such different antecedents come to work in the same school, it is found that though the certificated master is more successful at first, he is not the intellectual equal of the University man, and in course of time the University man makes the better master. In these circumstances it seems to me, as I hope it will seem to you, that the true inference to be drawn is this: not that professional preparation is a disadvantage to the schoolmaster, but that it is not such a great advantage as to make up for the want of general culture. If we contrast the certificated master, not with the graduate, but with the man who has never been to a University, and has, like himself, been teaching from an early age, we shall find the advantage lies, past a doubt, with the certificated master. When we can contrast men who have had both University teaching and professional training, with others who have had University teaching only, perhaps we shall find that in this case the advantage remains for life with the trained master.

* The intellectual attainments of the average young man on entering a Training College are thus described by the Inspector of the Colleges. Mr. Sharpe, whose judgment both from his well-known ability as an Inspector and from his official knowledge must be taken as decisive in this matter:—"I will state briefly what the young man of eighteen years of age, after an apprenticeship of five years, can do. The average candidate can work the ordinary rules of arithmetic, but not problems involving rules; he can write out a proposition of Euclid from memory, but cannot apply it intelligently; he knows just enough algebra to be confused; he can parse an English sentence fairly, and he has a very fair knowledge of the bare facts of geography and history; he has a slight smattering of a French or Latin vocabulary; he knows the ordinary forms of school-keeping. It must be allowed that a certain number are more advanced, but many pupil-teachers do not reach even this, very moderate standard."—*Report on Training Colleges for* 1873, *by H. M's Inspector, Rev. T. W. Sharpe.*

But what do I understand by a trained master? I mean a man who has not only acquired skill by actual teaching, but also knowledge, both theoretical and practical, by making a scientific study of education."

Directly we speak of theoretical knowledge the prejudices of many English people bristle up like quills upon the fretful porcupine. We are forthwith advised to leave theory alone and stick to practice. It was pointed out by an old scholar that many theological disputes arose from mere ignorance of grammar, and I have observed that many other disputes might be brought to a speedy termination if we would avail ourselves of the assistance of those benefactors of the human race—the writers of dictionaries. They are at the pains of pointing out to us that the sound which we suppose to stand for one idea, in reality stands for several; and it not infrequently happens that when we dislike one of these ideas, we pour the vials of our wrath, not on that idea only, but also on other inoffensive but unfortunate ideas which happen to be represented by the same sound. This is the case with the word *theory*. When with the aid of the dictionary we examine into the meaning, or rather meanings, of the word theory, we find that it comes from a Greek word, which word is itself derived from another signifying a *spectator*. *Theory* is first "the act of the spectator," the looking at a thing from a position outside of it. Next, it comes to mean the notion the mind gets of the thing seen. Very often we have only to see a thing in order to understand it, and then our theory of the thing is nothing more nor less than the truth about it. But sometimes looking does not give us a complete explanation of what we see; and then the mind goes to work to supply us with what the eye has failed to obtain, and our theory is no longer ascertained truth, but more or less probable surmise as to what the truth may be. Thus the word "theory," which at first meant the true account of a thing, has got to mean also "hypothesis" or conjecture about the thing. Now theory in this sense very often entirely misses the truth, and persons with a theory are much more likely to adopt a wrong course of action than persons who, if they do not know the truth, at least know that they do not know it. For instance, if I am ill, and a doctor comes to see me, and forms a wrong theory of my disease, the probability is that he will do me not only no good, but a great deal of harm into the bargain. And in all difficult matters we are sure to be bewildered by theoretical persons who trumpet their own speculations as a perfect revelation of the truth, and who, with the best intentions, will lead us into all sorts of mischief if we will be guided by them. There have been, perhaps there still are, great numbers of theorists in education, persons who are quite sure they have struck into the right path, and want us to leave the high road and follow them—no one can say whither. With theorists of this kind we are not unma-

turally impatient, but unfortunately this experience has led us to despise *theory* in its other meaning also, and to dread any attempt to see education as a whole, and to learn about it all the truth our intellectual vision will gain for us.

If any one here is in the habit of decrying the study of the theory of education, I would ask him to reflect, that in the sense of "view," "conception," *Ansicht* as the Germans say, every teacher must, of necessity, have his "theory" of his calling. If he will not be at the pains to look steadily at the thing, and get all the light he can thrown upon it, he will form his theory from careless and casual glances at it, and this theory of his will be narrow, partial, and very likely as mistaken as that of the rashest speculator.

(To be continued).

APPOINTMENTS

Appointments made by the Director of Public Instruction, between the 16th November 1879 and 15th January 1880.

M. Singaravelu Mudaliar, Deputy Inspector of Schools, Gooty and Pennakondah Circles, to be 3rd Master, High School, Caddapah, on Rs. 60 per mensem.

P. Kistnama Chetty, Acting Deputy Inspector, Gooty and Pennakondah Circles, to be Deputy Inspector of Schools, *substantive pro tem* on Rs. 80 per mensem.

R. Ramachendra Row to act as 7th Assistant, Combaconum College, *vice* N. Vencoba Row.

R. S. Noronha Acting Head Master, Normal School, Mangalore, to be Head Master, High School, Cannanore, on Rs. 90 per mensem.

C. Cuppusawmy Sastri, Deputy Inspector, Coimbatore, to be Deputy Inspector of Schools, Chittur, on Rs. 200 per mensem.

N. Murugesa Mudaliar, *to be Deputy Inspector, Ongole Range.*

C. Kuppusawmy Iyer, to be Head Master, Ongole, Middle School, *substantive pro tem*, on Rs. 10.

N. Krishnayyar, B.A., to be 3rd Assistant, Mangalore College, on Rs. 70 per mensem.

U. Raghmendra Row, B.A., to be 4th Assistant, Mangalore College, on Rs. 50 per mensem.

Mr. T. M. Hensman, B.A., to act for Mr. J. R. Thomas as Head Master High School, Tellicherry.

Mr. D. Joseph, B.A. to act as Head Master, High School, Caddapah.

S. Ramadas Iyer, B.A., to act as 2nd Master, Salem College.

T. V. Subramier, to act as 3rd Master, Salem College.

S. Varadanisawmy, B.A., to be 3rd Master, High School, Karnool, on Rs. 60.

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THE MONTH

We are sorry that the Female Candidates for Matriculation in our Local-University last December were not more successful. In the list issued by the London University last January, Miss Alice Elizabeth Lee stands at the head of the list in the Honours Division. Another young lady is also placed in the Honours Division, while twenty-seven other female candidates have passed the examinations.

Six students who went up for the last Matriculation and F. A. Examinations held at Combaconum and Madura having been guilty of fraud, their examinations have been invalidated and they are debarred from appearing at the next two examinations.

European and Eurasian pupils and students of Sanskrit will be glad to learn that with the approval of the Director of Public Instruction, Government have added Latin and Sanskrit to the list of Second Languages for the Middle School Examination.

Regarding the Applications of Funds of Local Fund Boards to Education, Government has recently laid down the following important ruling :—"The Government observe that there is no objection in principle to the allotment of Local Funds for the development of middle-class education in general, but that the primary obligation is to provide elementary instruction to the full extent needed for the classes contributing the funds, and that until this is done middle-class schools have no right to assistance." This enunciates an important principle, and goes some way towards settling what has been rather a vexed question but there will still be room for difference of opinion as to when "elementary education to the full extent needed" has been provided.

Dr. John Bradshaw, the Inspector of Schools for the Fourth Division, with reference to his edition of Milton, has received the following congratulatory letter from the Viceroy's Private Secretary :—

> "His Excellency has looked through the volumes with much pleasure and interest, and feels confident that their accuracy and completeness will make them valuable, not only to natives of India, but to the most cultivated and competent students of this great poet.
>
> "His Excellency congratulates you on having produced the most complete Edition of Milton's Poetical Works that he has yet met with, in a portable and readable form."

The last number of the official monthly statistics of the German Empire publishes a full analysis of the state of education among the recruits of the German army for the year 1878-79. The total number of recruits for the year was 143,119, of whom 2,574 or 1·8 per cent., could neither write their names nor read. The majority of the illiterate recruits came from the eastern provinces—East and West Prussia, Posen, and Silesia. They were 1,936 in number and formed more than 8 per cent., of all the men levied in these districts. Out of all the rest of Prussia there were only 332 men, without education, or about one-third per cent. Of the other German States, Bavaria sent 101, or ½ per cent., of uneducated recruits; Saxony, 19, or ¼ per cent.; Wurtemberg, 3 or ·05 per cent.; Baden, 3 or ·06 per cent.; Alsace-Lorraine, 149, or 3 per cent.; Hesse, 6 or ·2 per cent.; Mecklenburg-Schwerin, 8, or ·4 per cent.; and Brunswick, 6, or ·6 per cent.

We give below a General Table of the results of the First Arts Examination for the past six years. We hope it will be found correct. The corresponding Table for the Matriculation Examinations is still in preparation as the corrected returns for several schools have not yet been received.

F. A. EXAMINATION.

The following table brings together for the chief Institutions the results for the past six years :—

Rank.	Names of Institutions.	Number passed in						
		1874.	1875.	1876.	1877.	1878.	1879.	Total.
1	Kumbhakonum College	22	30	29	40	30	71	222
2	Madras Christian College	24	28	27	30	24	31	164
3	Presidency College	27	21	20	18	11	26	126
4	Trevandrum Maharajah's College	17	22	11	13	17	22	102
5	Rajahmundry College	3	7	6	16	12	15	59
6	Calicut Government College	9	12	2	12	6	7	48
7	Central College, Bangalore	9	6	1	9	12	8	45
8	Tanjore, S. P. G. College	8	9	5	9	5	8	44
9	Mangalore Provincial College	8	4	4	6	9	10	41
10	Trichinopoly S. P. G. College	4	7	4	2	4	15	36
11	Ernakulam College	...	...	4	7	10	6	27
12	Negapatam St. Joseph's College	5	...	1	5	3	10	24
13	Masulipatam Noble College	2	5	3	3	1	5	19
14	Bellary Government College	1	7	5	...	3	2	18
15	Coimbatore College	...	...	...	4	3	11	18
16	Doveton Protestant College	5	7	2	1	...	2	17
17	Mysore Maharajah's College	5	2	...	3	2	3	15
18	Bishop Cotton's College, Bangalore	...	3	2	2	2	4	13
19	Calicut Kerala Vidyasala	...	...	...	...	...	13	13
20	Vijianagaram College	...	...	...	...	...	6	6
21	Palamcotta C. M. S. Institution	...	...	...	...	2	2	4
22	Berhampore Government College	...	...	...	...	...	3	3
23	Shimoga College	...	...	...	...	*1	1	2
24	Tinnevelly Hindu College	...	...	...	...	...	2	2

B. A. and B. L. Examinations 1880.—In the month of January last one hundred and eighty-one candidates were examined in Madras for the B. A. and thirty-two for the B. L. Degree examinations. Eighty-five or nearly one half of the registered number succeeded in passing the former examination—3 in the first, 46 in the second, and 36 in the third class; and four or exactly one-eighth the number

that presented themselves passed the B. L. Degree in the 3rd class. The following is an analysis of the B.A. examination.

	1st.	2nd.	3rd.	Total.
Presidency College	1	16	13	30
Christian College	2	14	5	21
Rajahmundry College	0	2	8	10
Trivandrum College	0	6	0	6
Kumbhakonam College	0	2	4	6
Bangalore Central College	0	2	0	2
Negapatam St. Joseph's College	0	1	1	2
Private Study, &c.	0	3	5	8
Total...	3	46	36	85

The most noticeable feature in this Analysis is the great decline in the number of graduates from Kumbhakonam.

B. L. Degree Examination, 1880.

Third Class.

Srinivasa Rau, Mundukur, B.A., Presidency College.
Jambulinga Mudaliyar, Carugguli, B.A. Do.
Swaminatha Bavaji Pant, B.A. Do.
Annaswami Aiyar, A., B.A. Do.

B. A. Degree Examination, 1880.

First Class.

Rajagopalachari, Perungavur, Presidency College.
Kodandarama Aiyar, Tiruppalturai Panchapakesa Aiyar, Madras Christian College.
Joseph Eapen, Madras Christian College.

Besides these 3 First Class men there were 46 placed in the Second and 36 in the Third Class making a total of 85 successful candidates for the B. A. Degree.

The Latin and Greek subjects for the Gilchrist scholars to be allotted to India in 1881 are :—

Latin—Ovid, Metamorphosis, Book V. and Epistola ex Ponto, Book IV. Greek.—Xenophon, Cyropaedia, Book VII.

University of Madras.—The Arni Gold Medal in connection with the University has been awarded in accordance with the results of the last examination for the B. A. degree; also the Sri Goday Vari Sanskrit Prize. The University of Madras will soon after the 31st March award Rajah Sir T. Madava Row's prize. This prize was founded on the 29th Jan. 1869 by Sir Madava Row. The interest from the funded capital of Rs. 2,500 will be given away in two prizes to Hindu students born in the collectorate of Tanjore and who have lived 10 years in that collectorate. A portion of the interest will be awarded to the student who stands highest in the first class at the First Examination in Arts and the balance to the student

who stands highest in the Matriculation Examination. The Arni Gold Medal is to be given to the student who passes the B. A., degree and who obtains the greatest number of marks in Physical Science. The invested capital is Rs. 2,800 : the prize has been founded in honor of the Prince of Wales' visit to India. The Sri Goday Vari Sanskrit prize is awarded from the interest of Rs. 1,000 as a prize in money or books to the student who passes the B. A. degree examination in Sanskrit. The prize was founded with the object of encouraging the study of Sanskrit.

Education in Chingleput.—In the last published report of the Chingleput Local Fund Board, allusion is made to the working of elementary schools. The state of elementary education is considered anything but satisfactory. This is owing to the introduction of rules which require managers of schools to send in their applications to the President of the L. F. Board before the 1st January in each year. The reduction in the rates of grants and the curriculum of studies have more or less retarded the progress of education in the circle. In the beginning of the year there were 160 result grants schools in the Chingleput circle with 3,394 pupils. The number of schools taken under inspection was 49 while that of those closed was 71, leaving 138 on the list with 3,026 pupils on the last day of the official year.

Degrees conferred by the University.—It may be interesting to note that, since the establishment of the Madras University, the degree of Master of Arts has up to the end of last year been conferred on 16 candidates. Of these there is only one European. The degree of Bachelor of Arts has been conferred upon 668 candidates of whom 18 passed in the first, 374 in the second, 276 in the third class. The degree of Master of Laws has been won by four candidates, and that of Bachelor by one hundred and thirty-eight candidates of whom five passed in the first, 49 in the second, and 84 in the third class. Three candidates have obtained the degree of Doctor of Medicine; four the degree of Bachelor of Medicine and Master of Surgery; and two the degree of Licentiate of Medicine and Surgery. Only one degree in Civil Engineering is conferred by the University, that of Bachelor, which has been granted to 17 candidates of whom one passed in first, seven in the second and nine in the third class.—*Standard.*

At the recent examination for the Mathematical Tripos, four students of Girton College were examined in the papers set, and, by the kindness of four of the five examiners, their answers were looked over and reported upon according to the University standard. One of the candidates, Miss C. A. Scott, obtained marks which would have placed her high among the Wranglers. The other three—Miss B. Staley, Miss M. S. Ker, and Miss G. Jackson—would have been placed in the third class. This is the first occasion on which a lady, having fulfilled conditions precisely corresponding with those imposed by the University on candidates for degrees, has been pronounced to be qualified, as regards proficiency, for a place in the first class in a Tripos. It is interesting to note that this success

has been obtained in the great characteristic study of Cambridge, and one in which the work is of a specially arduous nature. The results of the examination are creditable both to the students themselves and to the lecturers at Girton College. These ladies, with others who have informally passed degree examination on the regular University conditions, will receive from the College degree certificates. It may be added, as an encouragement to those who are disposed to give much-needed help to women's education in the form of scholarships and exhibitions, that Miss Scott held a scholarship of £60 a year for three years given by the Goldsmiths' Company, and awarded at the Girton College entrance examination in 1876.

THE TRAVANCORE AND COCHIN SCHOLARSHIPS.—The Scholarships established in the Madras University by the Maharajah of Travancore and the Maharajah of Cochin are now vacant and the Senate of the University will proceed to award them on the 15th instant. The Maharajah of Travancore has given ten thousand rupees for a scholarship to be founded in connection with the University, the interest from which is to be awarded by the Syndicate to one of three students who shall attain the highest number of marks in the Matriculation examination or to any one of the students who pass the First Arts Examination, provided they qualify for the profession of Medicine or Civil Engineering. The Scholarship is to be confined to students born subjects of the State of Travancore. The holder will have to pass either the degree of Bachelor of Medicine or Bachelor of Civil Engineering. The Maharajah of Cochin's scholarship is for students born in the Cochin State qualifying to pass in Medicine or Civil Engineering after they have passed the Matriculation and First Arts Examinations. The fund is for Rs. 6,500 and it shall be lawful for the Syndicate to declare that the holder of the scholarship has forfeited it owing to misconduct. The amount of the scholarship founded has been increased by accumulated interest to Rs. 7,500.

ON Thursday evening last there passed away from amongst us an unassuming and distinguished native gentleman,—Chintamany Ragoonatha Charry, F.R.A.S., Head Assistant in the Madras Observatory for the last seventeen years. Attached to that institution for a period of over thirty-five years, he served in succession, in every grade under the late Major W. S. Jacob, Colonel W. K. Worster, Colonel J. F. Tennant, R.E., and the present Astronomer, and won the esteem and regard of each, by his intelligence, assiduity, and attachment to the pursuit he had adopted. His strict honesty and ready skill as an observer combined with accuracy and speed in computation, and a fair and useful amount of self-acquired mathematical knowledge, rendered him, until disabled by impaired health, invaluable in the Observatory; and the chief share in the Catalogue of Stars in hand, with the Transit Circle, since 1862, comprising already over 38,000 separate observations, is due to his personal exertions; besides many other special researches of a nature not often undertaken by ordinary assistants in observatories. His first paper communicated to the Royal Astronomical Society of London; "On the determination of personal equation by observations of the projected image of the sun," was dated 25th April 1859, and was

followed by other occasional contributions highly creditable to their author. He was elected a Fellow of the Royal Astronomical Society in January 1872, upon the joint recommendations of his immediate chief, the Government Astronomer, and Mr. E. B. Powell, C.S.I., then Director of Public Instruction. He was twice successfully engaged in observations of total eclipses of the sun: on the first occasion in August 1868, at Vunpurthy, in the Nizam's Dominions, in independent charge of a branch expedition for the purpose; and on the second, in December 1871, at Avenashy, in the Coimbatore District. He was the first and only native of India who has yet entered the lists as a discoverer of new celestial objects, having detected two new Variable Stars, *viz.*, R. Reticuli in 1867, and V. Cephei in 1878. As editor of the astronomical portion of the Asylum Press Almanac and of a native calendar published on his own responsibility, he has been before the public for the past twelve years; and he latterly took great interest in delivering public lectures on Astronomy with a view to enlighten his countrymen upon the subject, and to convince them of the absurdity of their notions in regard to celestial phenomena, by familiar explanations, in simple terms, of the true principles of the science, as opposed to the ignorant superstitions and rough predictions of Hindoo astrologers and empirics of the old school.—*Mail.*

THE NEW GRANT-IN-AID RULES.

GOVERNMENT OF MADRAS.

Educational Department.

21th January 1880, No. 18.

Read the following paper:—

No. 12. From Colonel R. M. MACDONALD, Director of Public Instruction, to the Acting Chief Secretary to Government, dated Madras, 9th December 1879, No. 4995-P.

I have the honor, with reference to G.O. No. 352, of the 15th September 1879, to state that I considered it desirable to give the Inspectors of Schools, the Principals of Arts Colleges, and the Principal of the Madras Normal School an opportunity of stating their views on the various points referred to in the memorial. I beg now to submit the replies which I have received with the following remarks.

2. Mr. Gopal Row expresses his concurrence in the suggestions of the memorial, but does not discuss any of them. Mr. Marden also concurs, but asks for additional rules on certain points which he specifies. Except in the matter of school fees Mr. Garthwaite is opposed to all the proposals made by the memorialists. The other gentlemen agree with the memorialists on certain points and disagree on others.

3. The memorialists suppose that one effect of the new rules will be the removal of the restriction on the issue of new grants, which they represent as having been in existence for ten years, and they appear to imagine that some new policy is in contemplation, as they "accept the substitution as a general rule of one-third grants in

place of the half offered by the present rules in the assurance that such grants will be given in all ordinary cases, when a school satisfies the conditions on which they are promised." I have explained in paragraph 29 of my letter, No. 1737, of the 1st May 1879, that the memorialists are entirely mistaken as to the nature and duration of the restriction on grant-in-aid expenditure, and there is nothing in the draft rules or the letter submitting them which seems to afford grounds for such expectations as those stated. In most schools the only effect of the new rules will probably be some trifling changes in the distribution of the existing grants. If some schools lose a portion of their grants, the claims for any new funds, which may become available in this way, will be so numerous and so pressing, that the most careful consideration will be necessary, and it will be quite out of the question to allot such sums to any schools, which happen to satisfy the conditions of the grant-in-aid rules. There is in fact every probability that as High Schools become more and more self-supporting, the restrictions on grants to such schools will increase instead of diminishing. Some important steps have been taken in this direction already, but Mr. Garthwaite in the following passage expresses his conviction that much more ought to be done:—

"The more discussion of these rules goes to show that in the opinion of Government the time has not come for making all higher education self-supporting, and for refusing all Government aid to higher class schools. My own opinion is that the time, if not fully come, is drawing very close, and that a beginning of the end should be made by refusing all aid to Colleges and Collegiate and Higher Class Schools in the town of Madras and a few others where the demand for higher class education is very great."

4. The memorialists themselves admit that the Managers of some schools are making a profit and they think that it should be distinctly laid down that whenever the fees and the Government grants are together more than sufficient to meet the expenses, Government aid should be withdrawn in whatever measure seems fair and suitable. Mr. Seshayya thinks that there ought to be some rule of this kind. He knows that in certain towns the Managers of Schools are making "education a matter of commercial speculation." Mr. Bickle takes a different view of the matter: "If such a rule," he observes, "were introduced, its effects would most likely be to restrict the school fees within such limits, after complying with the condition in this respect as the rules require, as would enable the income to meet the expenditure of the school; for I do not consider it probable that school-managers would increase the pecuniary burden of their pupils merely to curtail the grant; whereas if they were at liberty to increase the fee to the greatest possible paying capacity of the neighbourhood, means would be provided for ascertaining the time when a further general reduction might be made in the grants." The withdrawal or reduction of grants is in all cases a matter of administrative detail, and it does not seem to me to be necessary to frame a rule to meet this particular class of cases.

5. In paragraph 4 the memorialists state that the case of Colleges ought perhaps to be treated as special, but they merely suggest this matter for consideration without stating what exceptional treatment they would propose. Mr. Seshayya makes the following remarks on this point:—

"The scale of grant provided for in the draft rules seems fully to meet the exceptional requirements of Colleges advocated in this paragraph. A comparison of the actual charges of the Provincial Colleges, say of the one at Kumbakonum for example, with the grant likely to be earned by a Collegiate Institution teaching up to the B.A. standard, will show that the advantage is on the side of the latter. It must be remembered that Collegiate classes do not exist by themselves, that there are a High School and a Middle School attached to them, and that in well-attended institutions there is a pretty large saving from the two latter which goes to meet the expenditure on the former."

Colleges are multiplying all over this Presidency and it does not seem probable that Government will be in a position to spend much more than it is doing on institutions of this class. If, however, it is considered desirable to do so, it appears to me that Rule 27 affords an almost unlimited opening for such expenditure.

6. In paragraph 5 (1) the memorialists wish Rule 5 to be modified so as to make it clear that the Managers of Schools are at liberty to charge such fees as they like, provided these fees are not less than the rates prescribed by Government. The existing rule is that the amount is to be approved by the Director of Public Instruction, that it is in general not to fall below one anna and is to be paid by at least three-fourths of the pupils. This rule was practically superseded some years ago by the Notification of the 27th June 1871 fixing a scale of fees for Government and Aided Schools and reducing the number of free scholars to 5 per cent. In this Notification the following provision appears—

"The Managers of Schools are at liberty, if they think fit, to charge sums in excess of those specified; but it is not permissible for them to charge lower sums without the express sanction, previously obtained, of the Director of Public Instruction, who is authorised to lower the scales temporarily in cases where he considers them to be likely to seriously affect the progress of education."

Some changes have been since made in the scale of fees by the Notification of the 7th August 1877, but the provision above quoted is repeated in this Notification. The draft rule merely recognises the fact that Government does from time to time lay down rules regarding fees in Aided Schools. The rules themselves must of course be looked for in the Notifications prescribing them. At present the Notification of the 7th August 1877, read in conjunction with Draft Rule 5, is precisely what the memorialists ask for. No circumstances have as yet arisen to call for any change, but it is conceivable that such cases might arise. The Manager of a High School with a monopoly of higher education might for instance charge such exorbitant rates as to practically exclude all but the sons of rich men. At present Government possesses the power of dealing with such cases. The rule amended as proposed would limit the power of Government in this respect. The alteration proposed does not seem therefore expedient.

7. The memorialists wish "pupils" to be substituted for "boys" in Draft Rule 7, on the ground that the rule is meant to apply to girls' schools. The rule is one of the conference rules. I am not sure whether it was intended to apply to girls' schools, but I have no objection to its being made applicable by the substitution pro-

posed. Mr. Garthwaite considers that the rule does not go far enough and that there ought to be some restriction as to the average number of boys in the class taught by the teacher drawing the grant. It is of course undesirable as a general rule that there should be small classes of two, three, or four pupils, but there are circumstances which sometimes render the existence of very small classes a necessary evil, and at present I am not prepared to recommend that any rule be laid down on this point.

8. I have no objection to three hours actual class teaching per diem being accepted in the case of teachers of College classes, but I may remark that the draft rule, as it stands, goes beyond G. O., No. 192, of the 27th May 1878.

9. The memorialists consider that the Masters holding ordinary certificates should receive the same grants as Masters holding Normal certificates, *viz.*, one-third grants, and that Masters who have passed the general educational test, but are uncertificated, should receive grants of one-fourth and not one-fifth. Mr. Fortey makes the following remarks on this subject :—

"The two most important questions are—(1), How many classes are there to be of aided teachers? and (2), what proportion of the total salary of each class shall be paid by Government?

"In regard to the first point it seems to me that instead of dividing male teachers into three classes eligible for one-third, one-fourth, and one-fifth grants respectively, it would be better to divide them into two classes eligible, respectively, to one-third and one-fourth grants.

"I would give one-third grants to men who have completed their training in a Normal School and one-fourth grants to all others who have passed the prescribed general educational tests.

"You draw a distinction between men who have merely passed the general educational tests and those who have an addition served as teachers for two years and been favorably reported on by an Inspector. I would draw no such distinction. If an Inspector's report on any teacher is very *un*favorable the Government grant should, I think, be stopped, but if not I see no reason why the proportion of the grant to his total salary should be greater after two years' service than it was before.

"As the memorialists draw a wider distinction between these men and those who have passed merely the general educational tests than you do yourself and would place them on a level with those who have been trained in Normal Schools, I beg to record my opinion that the test afforded by teaching in the presence of an Inspector is necessarily more or less superficial and incomplete. When a Master teaches in the presence of an Inspector, he gives a short lesson on one subject and it is unsafe to infer his competence from the fact that he does not break down in the ten minutes or quarter of an hour devoted to this test, or that he can teach English well because he has given a satisfactory lesson on Arithmetic. It is true that a man may demonstrate his *incapacity* in a few minutes and therefore I would stop his *grant* if the Inspector reports that he is unfit for his post, but his competence is not so easily determined. All trained men should however hold certificates showing that they are fair teachers, and these should be signed by the heads of the institutions

in which they have been trained, who will have had ample opportunities of forming a reliable opinion on their merits.

"The reduction of the grants to men who have passed the general educational tests to one-fifth of their salaries seems to me to be too great a change to be made at once, and I would recommend that the fraction be one-fourth instead of one-fifth."

Mr. Fowler says—

"I would strongly deprecate the exclusion of Method from any examination for Teachers' Certificates. Paragraph 4 of your letter, No. 215, may be taken to show the necessity for *some* change; but the change I would suggest is in an exactly opposite direction to that proposed. I, too, would refuse to give a certificate for mere theoretical knowledge, not, however, by refusing to recognise this at all, but by requiring practice to go with it, and so admit to the examination in Method only (1) trained students, (2) actual teachers in schools. It cannot be but that a thorough and familiar acquaintance with certain sound principles must improve a teacher's practice. It is also necessary to give him practical directions. This Mr. Murdoch's book does, to a certain extent, and there would, I imagine, be no difficulty in getting a suitable book prepared including every thing required; and the conclusion that the subject should be excluded because, for one thing, the books hitherto prescribed are not sufficient, seems to me a mistaken one.

"With regard to the different scales of grants proposed, I observe that the memorialists to Government object to there being so much difference as there is between one-third and one-fifth grants to trained and uncertificated teachers respectively, on the ground that 'six months' training is not sufficient to warrant the preference.' They, moreover, 'see no ground whatever for giving trained teachers a preference over untrained ones.'* This latter means in other words that the training of teachers is useless; from which opinion I must differ. I quite admit that we have not made out of our training what might have been made out of it, and what, as I quite believe, will yet be made out of it. If the memorialists' contention is conceded, it follows as a necessary consequence, that, all training schools being useless, they should be closed. I am quite unable to support the views of the memorialists on this very important question, and approve of your proposals."

Mr. Seshayya's remarks are as follow :—

"The complication complained of is more imaginary than real. The real question at issue is whether the three qualifications proposed imply such an actual difference of merit as to justify the proposed difference of grant. In the present state of Normal Schools in this Presidency, there is wide room for difference of opinion as to the utility of Normal instruction. From what I have seen of trained and untrained men, while I readily admit that, in the case of elementary teachers, training has done them immense good, I must own that I have failed to notice any difference between the two, when they are above the grade of matriculates, and more so, when they happen to be graduates. In the case of the latter, superiority often

* Their words are :—"Comparing the second-class of teachers (untrained) with the first (trained), we see no ground whatever for giving the latter a preference."—Page 37 of G. O.

rests with the untrained men, which however is due to the fact that till lately but few of those who stood high in the University list ever joined the Normal School. Theoretically the classification of merit is just enough, but in this case, theory seems to be at some variance from actuality. Granting, as it will be the case when Normal Schools reach their proper standard of efficiency, that a Normal training is really a valuable preparation for the work of a teacher, the simple distinction between trained and untrained men may be applied to the case of teachers at their first entrance into service; but when an untrained man fulfils the conditions required for a certificate, he may be allowed the same advantages as those conceded to a trained man. Accordingly I approve of the modifications suggested by the memorialists of the Rules 16, 17 and 18."

Mr. Garthwaite makes the following remarks:—

"(i.) I disapprove of discontinuing the examination in the theory of teaching and school management in the case of any teacher seeking a certificate. I had six years' experience of teaching the subject, and three times as many years observations of how far a knowledge of it improves a man's teaching, and I consider it a subject easy to learn, and which once learned does practically result in giving a man more ability to handle a class, and more or less in improving his general style of teaching.

"(ii.) I think it highly desirable that the term 'Teachers' Certificate' should be given only to the certificate given to trained men who have passed in the general literary test, in the theory of teaching, &c., and in teaching a class in presence of the Inspector. If this restriction be not made, the effect will be, as it is at present, very misleading, even to the certificated men themselves."

* * * *

"I do not concur in any of the proposals made by the Rev. Mr. Arden and those with him, except the one reserving liberty to charge fees higher than the Government rates. The remarks as to six months' training in a Normal School not doing much, are not without justice, but six months is the *minimum*, and will in practice, I hope, be confined to students who have a great natural ability for teaching. A year is the *minimum* in England, and should certainly be the general rule out here. Most Normal Students in England have been pupil teachers before they entered the Normal School, and if I remember rightly the course generally extends over *two* years.

"(iv.) The proposal of the memorialists to equalise the grant to holders of ordinary certificates and holders of Normal certificates is one that if carried into effect would do especial harm inasmuch as it would work very much against Normal Schools. In every country where education is encouraged, Normal Schools are held to be not only useful, but necessary—and I regard it as far too late in the day now for their necessity to require proving. Government and even Missionary Societies having set up Normal Schools, it would be absurd to pull down with one hand what we are building with the other. Mr. Arden's proposal may seem justified by the small importance that is at present attached (*only in this part of India, though*) to training in a Normal School, when six months of it is supposed to be sufficient, (1) but the way to set the matter right is not to agree to the proposal, but to insist upon a better and more real training, for which six months is not enough. Any one who

knows how ignorant our Matriculates and F.A's, even some B.A's, are, of much of what they have to teach, how utterly destitute of that general knowledge requisite, I will not say merely to enable them to make their lessons interesting, but to keep them safe from positive error in explaining their text, will acknowledge that they have to be taught to know accurately enough for teaching purposes, what they passed in on a knowledge in many respects very superficial. They may have the minimum of knowledge requisite to scrape through a *pass* examination, but not that full and accurate knowledge that a teacher requires of what he is going to teach. To say that their deficiencies in this respect can be repaired, and also sufficient training in the difficult art of teaching given, or even the last alone done, *in six months* appears to me absurd. And to say that there is no difference between a teacher thoroughly trained, and one who has by practice acquired a certain knack in teaching appears to me equally absurd. One might just as well compare one who can play or sing by ear, and one who has gone through a long course of Science and Practice in a first-class Musical Conservatory."

Mr. Marden and Mr. Metcalfe would place the holders of Normal and ordinary certificates on the same level, and have only two classes of teachers' grants instead of three.

10. The general principle embodied in the draft rules of making a distinction between trained and untrained men is one which has been already approved by Government in G.O., No. 286, of the 5th October 1872, from which the following extract is taken:—

"On the first of these questions the Governor in Council has no hesitation in expressing his decided concurrence in Lieutenant-Colonel Macdonald's recommendation that the work of the Madras Normal Schools should, in future, be limited to the professional training of the students. The present position of the Madras Normal School, and apparently of those in the Provinces, appears to be very unsatisfactory. The Government are maintaining at a considerable cost institutions which answer in a very slight degree the purposes for which they are intended. It would seem that the Normal Students, except in comparatively few instances, neither seek nor are in demand for educational employment. They do not seek such employment:—

"1*st*, because they obtain in the Normal Schools general education as well as instruction in the art of teaching;

"2*nd*, because they have no reason to suppose that their training in the Normal Schools will give them any advantages over other candidates for employment as teachers.

"They are not in demand for such employment, because, under present circumstances, special training is not treated as a necessary qualification for it, and because the small supply of candidates from Normal School is, as a necessary consequence of the absence of encouragement which has just been noticed, of inferior quality.

"This state of things is much to be deplored, and no further time should be lost in applying a remedy. It is no doubt the fact, as Lieutenant-Colonel Macdonald remarks, that, in the early days of education, it was necessary to teach the student in the Normal School as well as to train them as teachers; but this necessity has long since passed away. The Director will at once carry out the change recommended by Lieutenant-Colonel Macdonald and limit

the Practising School in the Madras Institution to such classes as it may be advisable to retain in connection with the training of the Normal Students in the art of teaching. He will report how far these instructions can be acted on with reference to the Government Normal Schools in the Provinces.

"At the same time, in order to attract properly-qualified students, it will be requisite, as both Lieutenant-Colonel Macdonald and Mr. Fowler point out, to recognise the value of the training imparted in a Normal School, by requiring all candidates for employment in the Educational Department of Government to go through such a course of training, and by giving lower grants in aid of the salaries of masters in aided schools, who have not gone through such a course, either in one of the Government Normal Schools, or in some other training institution approved by the Director of Public Instruction.

"A prospective date from which this rule will be enforced should be notified."

Proposals based on this order were submitted by Mr. Powell to Government and in G.O., No. 325 of the 4th November 1873, it was decided that the question of having three scales of grants would be disposed of in connection with the reduced scale of salary grants recommended by Mr. Powell in his letter of the 17th September 1873. There has been further correspondence on the subject terminating with my letter No. 1127 of the 22nd May 1875, on which no orders have been passed. The following extract is taken from this letter:—

"The Managers consider that in higher class schools no difference should be made in the grants assigned to trained and untrained men, arguing that if the training is really beneficial, those who have enjoyed it will make their way without any special protection. All the past history of Normal Schools in this Presidency shows however that owing to the want of this protection the best men have hitherto had no inducement to enter the Normal Schools. The training either is or is not beneficial. If it is, the training Master should derive the same sort of advantage from his certificate, as the Physician or the Surgeon does from his diploma. If it is not beneficial, the superior Normal Schools should be at once closed, as they are maintained at a great cost, for which, according to this latter hypothesis, there is no justification. It is true that in Great Britain a University education is held to supersede the necessity of any instruction in the theory and practice of teaching, but the existence of such institutions as the Ecole Normale Supérieure of Paris shows that a different view has been taken of the question on the Continent, and indications are not wanting that even in Great Britain public opinion is undergoing a change on this point. The art of managing a school or of teaching a large class successfully may of course be acquired in time by any one, but experience shows that it is generally acquired at the expense of the pupils. It may be added that in the case of natives, a Normal School supplies in some measure one great defect in their education, *viz.*, the power of expressing themselves in decent colloquial English. With regard to middle class schools, the proposal is said to be premature because the supply of trained teachers is not equal to the demand. As a matter of fact however many more teachers might be trained even at Madras, if there was any real desire on the part of Managers of Aided Schools to get men trained, and many cases have been reported

Mofussil in which the demand has fallen short of the supply. The statement that the object of encouraging passed Normal Students might be sufficiently met, if it were provided that all men newly appointed to be Head Masters of Schools of the lower class should be chosen from their number, does not at all meet the difficulty, as such an institution as the Madras Normal School does not train men for such posts."

I am of opinion that the three scales of grants for trained masters, certificated masters, and masters who have merely passed the general education test should be maintained.

11. The memorialists observe that sufficient encouragement is given to Normal students because a Normal certificate can be obtained in six months, whereas an ordinary certificate cannot be obtained in less than two years. Mr. Garthwaite and Mr. Fowler both object to six months as insufficient, and Mr. Fowler considers that there is some inconsistency between the six months' training insisted on in Rule 19 and the provision for grants on account of Normal scholarships for a year or even two years in Rule 48. In the Madras Normal School six months is the period prescribed for the training of graduates. Matriculates and First Arts men remain longer under training, but not more than a year. In the Mofussil Normal Schools fifth-grade men usually have a year's training, but not unfrequently their training extends over two years, because they have not merely to be trained but to be taught. Similarly in the Government Female Normal School the full course extends over four years. Rule 19 is framed in general terms so as to include all cases, and six months must be regarded, not as the ordinary, but as the minimum period contemplated. It is a great mistake, however, to suppose that even a graduate who enters a Normal School for six months on a scholarship of Rs. 15 will at the end of two years be necessarily as well off as the graduate who has at once taken up a mastership. The substitution of a subsistence allowance for a comparatively handsome income during the first six months is not likely to be compensated by the difference between a third grant and a fifth grant during the next eighteen months. Whether a training of six months should not be regarded as sufficient even in the case of graduates is of course a matter of opinion. No comparison can be drawn between the curriculum of the Madras Normal School and the curriculum of the training Colleges at home, because a very large proportion of the time which a young man spends in an English or Scotch Training College is spent in going on with his general education. I very much doubt whether there is any training College in which the proportion of the two years' course devoted to the theory and practice of teaching amounts to anything like one-fourth, *i.e.*, six months.

12. Mr. Fowler and Mr. Garthwaite strongly object to the exclusion of method from the tests for an ordinary certificate. Their views are opposed to those held by the majority of the educational officers in this Presidency, who are probably influenced by the small practical results hitherto produced by these examinations in the theory of teaching. It is of course easy to make the test the same in this respect for Normal and for ordinary certificates, and as I have endeavoured to ensure that there shall be a fair amount of experience and practical skill, I have no objection to the alteration, provided it

is not made a plea for giving the holders of ordinary certificates the same grants as the holders of Normal certificates.

13. Rule 21 prescribing the date on which the examinations for certificates are to be held ought in the opinion of the memorialists to be made more clear by addition of words, stating that the examinations are other than University Examinations. The tests meant are of course the departmental tests, and if the rule is ambiguous, it should be altered. It may be observed, however, that the University Examinations are not the only non-departmental examinations recognized by this department. Under Rule 23 the Uncovenanted Civil Service Examination is recognized. This is now abolished but the new Middle School Examination, which is conducted by the Commissioner, will in future be a recognized test. To this may be added some of the tests in Science, Agriculture and Art which depend neither on University nor Departmental Examinations. The rule may stand amended as follows :

The departmental examinations for these tests will be held at Madras and at other places appointed by the Director of Public Instruction once a year, commencing on the 8th day of December, unless that day falls on a Sunday, when the examination will commence on the Monday following.

14. The abolition of the general test and the institution of a Middle School Examination controlled by the Commissioner for the Uncovenanted Civil Service Examinations will render the following changes necessary :—

In paragraph 28, *for*

Fourth Grade. The Middle School Examination laid down in Schedule B.

Fifth Grade. The Primary Examination laid down in Schedule C in the case of Normal students and Hindustani candidates, and the Uncovenanted Civil Service Examination, English or Vernacular in the case of all other candidates.

read

Fourth Grade. The Middle School Examination. First Class.

Fifth Grade. The Primary Examination laid down in Schedule C.

In paragraph 39, *for*

Second Grade. The Middle Examination laid down in Schedule B,

read

Second Grade. The Middle School Examination, First Class, with the test in needle laid down in Schedule B.

For Schedule B as it now stands,

read

B.

The Middle School Examination.

(*a*) Male and female candidates who obtain a first-class in the Middle School Examination but pass in one language only, fall under Rule 22. Such candidates can receive only imperfect certificates and the reduced grants attached to such certificates.

(*b*) Female candidates must pass the following test in needlework :—

Gathering, back stitching, working button-holes and darning on

calico, generally such work as is on the sleeve of a somewhat coarse shirt, or a native man's jacket.

15. The memorialists wish Pundits to be exempted from passing tests of any kind. Mr. Bickle and Mr. Seshayya concur with them. Mr. Metcalfe thinks that "they should be tested in the vernacular subjects of the several University Examinations and be classed accordingly, receiving say 75 per cent. of the grants allowed to that class." Mr. Fowler doubts whether, with a view to securing sound scholarship and better teaching of the Vernacular languages, there should not be instituted a special examination for Pundit's in language and ability to teach it, of perhaps three standards. Mr. Garthwaite makes the following remarks :—

"(vi.) The proposal that Pundits and Munshis should be exempted from any educational test is also mischievous. I have had much experience of this class of teachers, and have sufficient knowledge of the languages they teach, to be able to understand and judge of their teaching. No class of *teachers more requires the stringent application of some educational test, especially one to test ability to teach than this.* In general they have no idea of teaching, and too often the instruction they give is worthless. At the same time, I think that the fifth or even the fourth grade examination is not suitable for them. A special examination testing their acquaintance would sound philological principles, and their knowledge of English and Sanskrit sufficient for their work, together with their teaching power, and their ability to handle a class, are what is required."

A Pundit ought to be a man of general education, a respectable Sanskrit scholar and a good Vernacular scholar, and he ought also to understand the art of teaching and managing a class. In Government Middle Schools Pundits of the old type have disappeared, the regular masters being expected to teach the vernacular. Even in some High Schools the same system is being tried, and in Government Colleges Matriculates, First Arts men, and even graduates are beginning to be employed as Pundits. It is probable that the example set in Government schools will be followed sooner or later in aided schools, and I doubt whether anything should be done to encourage Pundits in remaining entirely ignorant of *such subjects* as Geography, History, Arithmetic, &c. The fifth-grade test is a very humble one and there does not seem any great hardship in requiring a Pundit to show that he possesses this amount of general elementary knowledge. It is of course not in any way a suitable test for a Pundit in the way of vernacular scholarship, but it seems scarcely necessary to institute a special examination for a class of teachers who are gradually becoming extinct. I would therefore leave the rule as it stands.

16. Although special reference is made in Rule 33 (*c*) to science certificates obtained in the Presidency College, provision is also made in Rule 38 for the recognition of other certificates. I have, however, no objection to the substitution of the words "any affiliated college provided with the requisite means of teaching the subject."

17. Mr. Fowler, Mr. Bickle, and Mr. Seshayya consider that the scale of salaries proposed by me for schoolmistresses is sufficiently high. The salaries proposed by the memorialists are exactly double the salaries assigned to schoolmasters of the same attainments. I doubt whether such high salaries will usually be necessary, but in

consideration of the increased difficulty of the examinations, I agree to the higher scale of salaries proposed.

18. Mr. Fowler thinks that writing masters should be recognized. Mr. Bickle's remarks are as follow: "There seems no necessity for introducing a special grant for writing masters, as the duties of such a teacher might properly be entrusted to one of the masters competent to do the work and such part of his time as remained unoccupied in this manner might be utilized in teaching the usual subjects." Mr. Seshayya considers that whether it is necessary to give grants to copy masters is a question of economy more than of principle. I may observe that grants have always been given under the former and the existing rules to writing masters and that there is nothing to prevent such grants being given under the new rules. If it is meant that grants are to be given to writing masters who have not passed any of the general education tests, I think that no encouragement should be given to the employment of such men. As it is the copies set in many schools are full of bad spelling and bad English.

19. Mr. Fowler makes the following objection to Rule 10, Clause 6th: "'Then they shall sell the building.' This seems to imply that Government must buy. It should be left optional to Government." I understand the rule to mean that in the event of the managers being unable or unwilling to refund such portion of the building grant as may be determined by arbitrators, they may be compelled to sell the building to Government at a valuation. It does not seem intended that Government shall necessarily buy the building. No change has been made in the rule which has been in existence for many years and I see no object in altering it. The memorialists object to building grants being paid out of Provincial Funds. Mr. Bickle is opposed to them on this point. Mr. Seshayya makes the following remarks on the subject.

"The Educational Building Fund is really the property of Hindu Temples, for it is the savings from their revenues, accumulated while they were under the management of the late East India Company. A very large portion of the fund has already been spent in the way of grants to mission schools, and it does not appear to be fair that the rest of it should be spent in the same direction."

Under any circumstances the Educational Building Fund will not last very long and the more burdens are thrown on it the more rapidly will it become extinct. The question is one which has never been referred to in the rules and, as it has been already decided by Government, it seems unnecessary to discuss it. As a matter of fact all building grants to aided schools are now being paid from Provincial Funds.

20. The memorialists acquiesce in the abolition of grants for contingencies, maps and prizes, but they consider that grants should be continued for servants, furniture, and libraries. Mr. Fowler would give grants for furniture, maps, and libraries. Mr. Metcalfe would give a grant once for furniture, and maps. Mr. Bickle is in favor of grants for servants, furniture, and libraries if funds are available. Mr. Seshayya considers that the draft rule is dictated by consideration of economy and that nothing can be said against it. The only reasons for discontinuing all these grants are the difficulty of regulating some of them and the want of funds. As it is, library

grants have never been given regularly. If a school is once started with a proper supply of furniture, the annual cost of repairing or renewing furniture is not heavy. Rule 6 provides that salary grants shall not be given to a school until it is provided with such furniture as may be necessary. The first outlay on furniture is not to be compared with the cost of a building, and is in most cases not more than may be reasonably expected from managers who undertake to set up a new school. There are not therefore, I think, the same grounds for giving furniture grants as building grants and it must be remembered that even in the case of building grants it is proposed to abolish grants for the maintenance of buildings. Servants are of course necessary, but they are not so necessary as masters and there are now many schools which cannot get any grants for masters, because the money which might be made available for such grants is spent on peons and sweepers.

21. In paragraph 5 (13) the memorialists observe with reference to Schedules A, B and C that it would be well to make clearer what is no doubt implied, that candidates may go up and pass in one language only, this limitation, however, carrying with it certain disabilities in respect of employment. It appears to me that Rule 22 is sufficiently explicit on this point.

"The examination of European and East Indian teachers in a vernacular will not be essential when they are employed in schools intended mainly for European and East Indian children. Similarly in the case of Hindu or Mussulman teachers employed in Hindu or Mussulman schools examination in English will not be essential. In the case of teachers passing in but one language the maximum grant will be only 75 per cent. of the sum specified except in the lowest grade, in which only one language is prescribed."

Schedules A and B, clause (a), both contain the following provision:—

"(a.) To obtain a certificate a candidate must pass in all the compulsory and two of the optional subjects. Candidates coming up for an imperfect certificate under Rule 22 will be required to pass the same examination with the exception of the omission of one language."

Schedule C contains no such provision because only one language can be brought up for this examination.

22. In paragraph 6 the memorialists inquire how the new rules are to be applied to teachers already employed. Mr. Furley considers that the managers ought to have ample notice to enable them to make their arrangements, but observes that if all teachers, now in receipt of grants, are exempted from the operation of the new rules during the rest of their service, a good many will probably be retained permanently in posts for which more competent men are available. Mr. Seshayya considers that the application of the rules recommended by the memorialists should be allowed, provided that discretion is given to the Director of Public Instruction to make reductions in the present rates of grants, when they seem to be needlessly high, or undeservedly bestowed. It must be remembered that these discussions about reducing the scale of grants have been going on for many years, ever since in fact Mr. Powell's letter, No. 1932, of the 17th September 1873, was referred for remarks to the managers of mission schools. It seems to me that it will be enough to declare

that teachers who are entitled to maximum grants under the present rules will be allowed to draw maximum grants under the new rules until the 31st December 1881 and that teachers who are entitled to minimum grants under the present rules will be allowed to draw, not minimum but one-fourth grants under the new rules for the same period.

23. Mr. Marden makes the following remarks regarding certain cases for which he considers that provision should be made :—

"There is one point on which I wish to offer a suggestion. As the rules stand, a grant depends only on two conditions—first, that the manager pays his portion ; and second, that the teacher possesses certain qualifications. Nothing is said about the work the teacher is to perform, it being assumed that no manager will pay his teacher more than the market value of his labour.

"Now experience has shown that there are two cases in which this is an insufficient safeguard. The first is the case of religious bodies where the mere secular work is a secondary consideration, and where managers will pay a good deal more than a man's value, considered simply as a teacher, in order to secure a person imbued with their own religious convictions. The case of the late Mr. Yorke of the Dindigul Training Institution was an example of this. Mr. Yorke for many years received a salary of Rs. 250, the Government contribution being Rs. 125, to do work of less importance than was being done for Rs. 30 in the taluk school of the same town and precisely the same work as was done, and thoroughly well done too, for some three years during his absence in England, by a native master who received Rs. 30.

"The second is the case of a fraudulent manager who agrees with his teacher to content himself with the Government grant and what can be raised by fees and subscriptions whilst signing a receipt for the full amount of grant. The object of such a manager is to secure a grant above the market value of his man in order to raise the amount payable by Government. Thus, suppose the salary which the teacher is really worth is Rs. 20 and the fees average Rs. 8. If the manager gets Rs. 12-8-0 from Government, and with the Rs. 8 from the fees he gets his Rs. 20, *plus* half a rupee extra. In return he signs his Acquittance Roll for Rs. 25 and no one is the wiser until the parties quarrel, and even then the matter seldom comes to the ears of the Inspector, it being evidently the interest of both parties to keep it quiet. And in this way Government is defrauded; honest teachers are placed at a discount and trickery flourishes. It is generally supposed by Inspecting Officers that the practice above described is not at all uncommon, but for the reasons I have mentioned not many instances come to light.

"To meet these two cases I would propose that there should be a rule to the effect that no teacher should receive a grant higher than one calculated according to what would be the salary paid in a Government school for the work which he is to perform in the aided school.

"There is another rule that would be very desirable, and that is that grants should be assigned for certain work, and that the managers should not be at liberty to assign to the teacher any other work without the sanction of the department. As the rules now stand a teacher who has received a grant for teaching a fourth class may be made to teach a third where his pay is unnecessarily high, or a fifth where his qualifications are insufficient, at the discretion or whim of the manager. The latter is the most frequent case and a man who has received a grant for teaching say twenty boys in a fourth class is set to teach a fifth class of perhaps five boys, where he can never produce good results, whilst for the sake of the dignity of 'raising the school' the really sound education he was before giving to the mass of the school is entrusted to one or two ignorant assistants and all but five boys at the top are deprived of the instruction for which the State is paying. It is not uncommon to find at inspection three boys in the highest class, of whom one is absent, and one unfit for the class, leaving one to be examined as the result of eight or twelve months' work on the part of the principal teacher, and all the while there will be a school of a higher class a few miles off, where the boys could have obtained better instruction without costing the State an anna, the class which they would have joined being already in existence and not full."

The grant-in-aid system is of course open to abuse, but I think that some of the abuses referred to by Mr. Marden can be dealt with under the existing rules. If a teacher's salary is unnecessarily high for the work which he is doing, a grant can be refused or given at less than the maximum rate claimable under the rules. If a teacher is employed on work above his capacity, his grant can be withdrawn. Rule 11 seems to me sufficient.

24. Mr. Fowler inquires with reference to the Middle Examination in Schedule B whether English weights and measures are excluded under the head of Arithmetic. The wording is mainly founded on the existing rule for the fourth-grade test which is "Colenso's generally, omiting duodecimals, cube root and stocks. Also the chief Indian Weights and measures." It was not intended to exclude the chief English weights and measures. Mr. Fowler makes the following remark with regard to Geography : "Clyde. This is a very dry, unsatisfactory book. The Manual or Mr. Duncan's Parts I and II are much to be preferred." I may remark that the words used are "The Geography of Asia and Europe as contained in Clyde's Elementary Geography, or any similar book." Clyde's Elementary Geography was recommended by the Committee for the revision of text books and the portions named are read in the lower and upper fourth classes of Government schools. No particular book is however actually prescribed in Schedule B as any similar book may be used.

25. The following is a part of the test in school management laid down for first, second, and third grade schoolmasters and first-grade schoolmistresses :—

(a.) To answer questions on the best methods of teaching English and Vernacular reading, spelling, grammar, composition, translation, writing, arithmetic, geography, and history in a higher-class school.

Mr. Fowler proposes to insert the words "and Euclid" after Arithmetic. "There is," he observes, "no subject worse taught than Euclid, while, if well taught, it should be the best instrument of discipline in the whole school curriculum."

A part of the test for fourth-grade schoolmasters and second-grade schoolmistresses is as follows :—

(*a.*) To answer questions on the best methods of teaching reading, spelling, grammar, writing, arithmetic, and geography in a middle-class school.

Here again Mr. Fowler would insert "and Euclid."

Euclid was purposely omitted, because the test is one to be undergone by schoolmistresses as well as schoolmasters and as a general rule schoolmistresses do not learn or teach Euclid, although the scheme permits them to bring up this subject if they wish it.

26. Mr. Metcalfe makes the following remarks on Rule 57 :—

"Rule 57 provides 'that if the college or school be closed within five years from the date on which the grant for apparatus, &c., may have been made, the Government shall be at liberty to purchase the apparatus.' Who is to receive the money? The managers have no right to appropriate it as it belongs to the public; and the school has ceased to exist. The Government would appear to be the proper recipient as trustee for the public and should take over the whole establishment using the proceeds for some public purpose."

Under Rule 56 half the cost of the apparatus, diagrams or examples may be met by a grant. The other half must of course be paid by the managers. The managers have therefore the same right to the apparatus as Government. The rule accordingly provides that the apparatus may be purchased by Government at a valuation to be determined as in the case of school-buildings by arbitrators, credit being taken in each case for depreciation due to wear and tear. In fixing the valuation the arbitrators are of course required as in the case of school-buildings to deduct from the price such portion of the grant as may seem equitable. I do not see any reason for altering the rule.

27. I have now gone through the objections and suggestions both of the memorialists and of the officers to whom their remarks have been referred. The following is a summary of the concessions proposed in this letter :—

Para. 7. Amendment proposed by memorialists in Rule 7 accepted.
Para. 8. Do. do. Rule 8 do.
Para. 11. If Government consider it expedient, Rules 20 and 24 to be amended so as to make candidates for ordinary certificates undergo the same test in the theory of school management as candidates for Normal certificates, their grants remaining unchanged.
Para. 13. Rule 21 to be amended as stated.
Para. 14. Rules 23, 35 and Schedule B to be amended in consequence of the abolition of the General Test and the institution of a Middle School Examination.'
Para. 16. Rule 33 (*c*) to be amended as proposed.
Para. 17. Rule 42 to be amended as proposed.
Para. 22. Teachers who are entitled to maximum grants under the existing rules to be entitled to maximum grants under the new rules until the 31st December 1881 and teachers who are now entitled to minimum grants to receive one-fourth grants under the new rules for the same period.

No. 13. ORDER THEREON, 24th January 1880, No. 18.

His Grace the Governor in Council sanctions the revised draft of grant-in-aid rules, subject to the amendments accepted or suggested by the Director in paragraphs 7, 8, 13, 14, 16 and 17 of the letter above read.

2. As regards the subject referred to in paragraph 11 His Grace in Council considers that in no case should a certificate be granted to a Normal student whose period of training has been less than twelve months; but he agrees with the Director in thinking that it is expedient to add the theory of school management to the test of candidates for ordinary certificates.

3. The appropriation of the Educational Building Fund will not be disturbed.

4. His Grace in Council considers that grants should be allowed for school furniture, maps, and libraries, but the grant should be allowed once only in the case of furniture and not more frequently than once in five years in the case of maps. Grants in aid to libraries will not be restricted, but the disposal of applications for such left wholly to the discretion of the Director of Public Instruction.

5. His Grace in Council considers that Rule 22 is sufficiently explicit as it stands.

6. The period during which the privileges secured under the old rules as regards grants referred to in paragraph 22 of the above letter will be allowed to operate until the 31st March 1882, or for a period of two years from the introduction of the rules now sanctioned.

7. His Grace in Council is disposed to admit the force of the suggestions made by Mr. Marden as quoted in the Director's letter, paragraph 23. The Director will submit draft rules giving them effect for the approval of Government. The provision contained in Rule 11 does not appear sufficient for securing the due employment of a teacher or for gauging the grant which he should receive. This draft rule should however be so framed as not to restrain unduly the powers of managers as to the particular employment of a teacher—possibly a provision that a teacher shall not be employed except occasionally on work not specified at the time of application for grant, without intimation of such change to the Divisional Inspector, would suffice.

8. The code of rules now approved will come into force from the 1st April 1880.

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*BISHOP CALDWELL ON MISSION SCHOOLS.**

Hindu boys voluntary learners.

THERE are two reasons why the pupils in our Mission Schools may claim to be regarded as voluntary hearers. The first is, that it is a remarkable peculiarity of Hindu boys of the better classes that, though sent to school at first by their parents, whether they like it or not, ere long they take the question of their education into their own hands, select their own school, and are generally more eager to attend school than their parents are to send them. Hence if they did not like the religious lessons they were taught in Mission Schools they would at once migrate to Government or Hindu schools,

* Extracted from Bishop Caldwell's published letter "On Reserve on communicating Religious Instruction to non-Christians in Mission Schools in India" to the Right Rev. the Lord Bishop of Madras.

in which religion was not taught. The other circumstance is one which has often been noticed. It is that there is no lesson taught in our schools in which the pupils generally take more lively interest than the Bible lesson. It does not contribute to their passing any of the examinations for which they are all eagerly preparing, yet I can testify from my own experience of the last year it is their answers evince. The parents may not like the Bible lesson—though they too would undoubtedly like it if fear of conversion were at an end—but there can be no doubt about the pupils liking it. It may therefore, be held, I believe, that the pupils in our Mission Schools have a right to be regarded as voluntary hearers of the truth, and as persons willing to be taught.

Hindu pupils in our schools thoughtful hearers of the truth.

Nor are they voluntary hearers only, but thoughtful and intelligent hearers also. Generally indeed they are so much more thoughtful, if not also more intelligent, than English boys of their age would be, that they must be considered quite as responsible for their belief as their parents or any other adults who chose to listen to Christian teaching could be supposed to be. In so far as the question of responsibility is concerned, I see no reason indeed why the majority of the pupils in our great Indian Schools should not be regarded as on a level with the majority of the people in the streets of Corinth, or even of Athens, to whom St. Paul preached Jesus and the Resurrection.

Hindu pupils not given to scoffing.

But is it not certain that many of those youths will scoff at what they hear? Such cases will doubtless sometimes occur, but they must always be very rare in India. Hindus are a reverential, indeed a religious, people, exceedingly averse to scoffing at foreign forms of religion—though equally averse to adopting them as their own. If there is any scoffing it is on the part of some who have left school. I may add that even then it is not indigenous, but has been learnt from sceptical Europeans, who fill the Indian newspapers with their scoffs against Christianity and poison the popular ear. No person who has had any experience in Missionary teaching in India can do otherwise, I think, than prize highly the opportunity offered him, for an hour daily, of systematically teaching the fundamental facts and doctrines of Christianity to so attentive, so thoughtful, and so receptive an audience as the pupils in a good Missionary Anglo-Vernacular School.

But it is alleged that in some cases the Christian truths we communicate to the pupils in our schools will be counteracted by the parents.

This apprehension is unfortunately too well grounded, especially in those cases—though I do not think they are very numerous in this part of India—in which the parents are bigoted opponents of Christianity. It is quite true also, as has been alleged, that one reason why many Hindu parents send their children so readily to Missionary Schools is their belief that the risk which the religious teaching introduces will be counteracted by their surroundings; but speaking from my own experience I cannot admit that in the majority of cases the Christian teaching received by the children in the schools is *intentionally* counteracted by the parents at home. On the contrary the parents are rather pleased than otherwise to hear the new Christian ideas about morals, philosophy, and history which the children bring home with them and which they sometimes delight to discuss. The point at which they stop short is that of conversion. Without any dislike for Christianity as a religion—regarding it on the contrary as an excellent religion, probably the best in the world—they are so intensely nationalistic and conservative, and so intensely jealous about the retention of their social respectability, that they will on no account consent to a conversion taking place. At this point they turn fiercely round and resist with every weapon that indignation can supply. It is somewhat the same with the pupils themselves, though in a less pronounced degree. As a rule they are quite willing to be instructed and even to be convinced, provided only that they are not required to act on their convictions. In Indian school work, then, the difficulty we have to deal with is not so much the resistance of the mind to the truth, as the reluctance to change, the absence of moral courage, the gulf between convictions and actions, which so generally characterise the Indian mind, and which nothing can overcome but special Grace from above.

Will the truths learned at school be counteracted at home?

Hindus respect Christianity.

Even, however, though we should suppose all Hindu parents equally active and determined in their opposition to the Christian teaching their children receive in school, I should not feel called upon to do anything but regret the fact. It might appear indeed to be almost a hopeless task to carry on a Mission School under such discouraging circumstances, but so long as the young people voluntarily and attentively listened to Christian teaching I should see nothing in it to condemn. At the worst it would be like "going forth weeping bearing precious seed." If a Roman Catholic priest baptizes the sick children of heathens he meets in the streets without the knowledge or consent of their parents, in the hope that the seed he sows may bear fruit hereafter, how much more may not the teacher of a more Scriptural faith be allowed to sow in the minds of his pupils the good seed of the Word of God, notwithstanding the multitude of birds of the air that are ready to swallow it up, in the hope that some seed may escape and bring forth fruit unto eternal life. I do not take such a gloomy view of the school department of missionary work myself, but if there are any who take this gloomy view and yet continue to work on in patient faith, hoping against hope to see some day the fruit of conversion, all honour, I say, be to those brave hearts, worthy of a place in the fore-front of the army of Christ.

Hoping against hope.

Some of your correspondents observe that their experience of what heathen children are has made them shudder at the very thought of throwing Christian truth in the midst of such surroundings as theirs.

It is my impression, on the other hand, that the surroundings of many a Hindu youth, though un-Christian are not necessarily or always anti-Christian, that on the whole they are not much worse or much more unfavourable to the development of faith and piety than the surroundings of many nominal Christian children,

Surroundings of Hindu youths.

and that a longer and more intimate acquaintance with the Indian mind would probably lead the objector, instead of shuddering at the effect of its contact with Christian truth, to anticipate, the best results in God's good time from the contact of a goodness which is more nature with so much that is naturally amiable. But even if the surroundings of Hindu children were in all cases as dreadful as has been supposed, Christian truth has to be taught to them all the same. The Gospel has to be preached to them, as "to every creature," all the same. When we preach Christianity to adult heathens, whether in the streets, or to a more select audience in lecture rooms, we have no security that their surroundings, shall not be much worse than those of the pupils in our schools, or than their own were when they also were at school. Yet whatever the results may be we go on preaching to them the Gospel of salvation through the Cross all the same, nor can we cease doing so except we are prepared to abandon altogether the work committed to us by our Lord and leave India in despair. Yet it does not appear to be our Lord's will that we should shudder even at the "savour of death" our words may in some instances carry with them. I am sure it is not His will that we should shudder to such an extent as to cease preaching His truth to heathens. Certainly St. Paul, as we have seen, whether his word proved to be a "savour of life unto life or of death unto death," considered that he was being "led in triumph in Christ in every place." As you observe, "shuddering in such a case as this is like weeping for the dead. Each is natural and allowable within certain limits, but care must be taken lest the one drift into discontent and unbelief and the other into disobedience to our Lord's express commands. Natural feelings must never be allowed to override Christian duty."

Should we shudder at the savour of death our words sometimes convey?

Some of the remarks made on the results of the teaching in our Mission Schools are particularly severe. Some conversions, it is said, may result from our practice, but they are counterbalanced, and a great deal more than counterbalanced, by the mischief which is to be set on the other side.

The amount of good our Mission Schools have done, if estimated by the number of conversions alone, is certainly very small, but I am not inclined to regard conversions as the only criterion of success. That was probably the idea of some of those good men by whom the schools were originally set on foot, but the means they used for the accomplishment of this purpose have brought into existence, without their intention, possibly in some cases contrary even to their wish, a whole class of influences of a more or less decidedly Christian character, by which national results of great importance appear to me to have been produced. Whence has arisen the public spirit, the zeal for the public welfare, which we now see pervading the better portion of the Hindu community, but from the Christian teaching in our schools? self-sacrifice—name and thing—was wholly unheard of till the teaching of the Cross became known. I am aware that some Hindus are unwilling even to credit Christianity with the Christian ideas and feelings they have adopted, but the fact that the Indian mind of the present

Amount of good done by Mission Schools.

is leavened with Christian principles unknown to the men who lived when I first came out to India is, I believe, a fact all the same. I cannot therefore but consider the view taken by some of the mischief produced by the Christian teaching in our schools far too gloomy.

Even as regards conversions the strength of the case for our Mission Schools cannot be appreciated without a comparative reference to the results of other methods. I restrict my remarks to the Presidency of Madras, but as I have been well acquainted with this Presidency for forty-two years my remarks may carry some weight. I have also had some experience in the work of conversion myself, and have tried in succession every variety of method. Let me mention then the remarkable fact that during the whole of this long period not one educated high caste Hindu, so far as I am aware, has been converted to Christianity, in connexion with any Mission or Church, except through the Christian education received in Mission Schools. Such converts may not be very numerous, and I regret that they are not, BUT THEY ARE ALL THAT ARE.

Conversions through Mission Schools compared with conversions by other means.

To be almost a convert is the highest point many well disposed Hindus have reached at present. They are timidly waiting for a general movement which they will be able to join without personal risk; but the time may any day come when masses of them will become not only almost but altogether followers of Christ.

The number of school conversions has fluctuated at different times and in different places, and different persons may hold different opinions as to the cause of their cessation or diminution; but without entering into this question here I may add one word of explanation. Any recommendation I might feel inclined to make would certainly not be to the effect that the Incarnation and the Cross should cease to be taught in our schools. I do not think it likely that the concealment of Christianity would be more productive of conversions than its open proclamation.

Will the concealment of Christianity produce more conversions?

It is well known how large a number of converts belonging to the class of educated high caste Hindus were the fruits of the educational labours of the late Mr. Noble in Masulipatam and of Mr. Cruickshanks in Palamcotta, both in connection with the Missions of the C. M. S. In my own sphere of work in the Missions of the S. P. G., in Tinnevelly and Ramnad, I can testify from my own knowledge that the only converts we have had belonging to this class have been the fruit of the teaching of Christianity in our Anglo-Vernacular Schools. Those converts were at the time, or had formerly been, pupils in those schools, and it was in those schools that they acquired those convictions and impressions that led to their conversion. In this way we have had conversions in connexion with the S. P. G. schools at Radhapuram, at Kulasekharapattanam, at Alvar Tirunagari, and at Ramnad.

Illustration of conversions through Mission Schools in my own experience.

The conversions at Alvar Tirunagari deserve special mention in this connexion, not only on account of their number and the interes-

ting circumstances connected with them. But because of the part taken in them by a member of another Society, the Society of St. John the Evangelist, Cowley, who had been accustomed to work in other parts of India. I refer to the Rev. Luke Rivington. Mr. Rivington during his three visits to Tinnevelly has seen nearly everything that is being done by the S. P. G. Missionaries, and has done much himself, in his own special work as a Mission preacher, but the only place where he saw educated high caste Hindus coming to Christ and had the pleasure of assisting in bringing them was Alvar Tirunagari. It will be desirable that I should here let my journal of my visit to this place in February 1877 speak for itself, instead of using words that might seem to be introduced to serve a special purpose.

Mr. Rivington.

Quotation from my journal of 1877.

"Mr. Rivington had frequently expressed a wish to pay a visit to some place where I was carrying on my evangelistic work, and I had promised that if I found it possible I should invite him to join me, if only for a day, at Alvar Tirunagari. As soon as I had given my first address in the great hall of the temple I saw at once, not only that there would be no difficulty in the way of his addressing the same class of people in the same place, but that his doing so would probably be attended with very great advantage." * * *

"Mr. Rivington's address in the great hall was a perfect success. Nothing could have been more appropriate to such an audience than the subjects and illustrations chosen, and as I had no work myself to do I could see that the great majority of the people listened most attentively, with frequently repeated signs of approval. [He selected two subjects to preach about—Sin and Salvation.] The number of non-Christians present was over 1,000, and in addition to this the number of Christians was nearly 200. The spectacle with all its surroundings was quite unprecedented in my experience—I had seen before nothing at all resembling it—and I think it must have been unprecedented in India." * * *

"I trust that the burning words then uttered will leave an indelible impress in many minds, and I believe that even the spectacle itself, considered simply as a spectacle, will teach useful lessons and do good. Every heathen, every Brahman, present must have gone away with the impression, that, after all, Christianity was not fitted to be the religion merely of the poorer classes, but was born to rule and save the world."

"As I found it would be necessary for me to leave on the evening of the fifth day I resolved to devote the last two days of my stay to work of a more special kind. The general addresses in the great entrance hall of the temple required to be followed up by more private special addresses in a building under own control. Accordingly I invited those who were willing to assemble daily, in our school room, and there I set about "separating the disciples" and inviting those who wished to be Christ's sheep to hear His voice and follow him. On the evening of the first of those two days six young men and boys came to my tent and told me that they had now finally resolved to declare themselves Christians. On this occasion for the first time they all came without their heathen marks on their foreheads, and for the first time also knelt down when prayer was offered. They told me that they had just then come from the river side, where they had been holding a meeting for prayer, and that they had there resolved to follow the example of Lydia, whose heart had been opened to receive the truth, preached to her by St. Paul in a similar place. The following morning at our morning prayer three more young men followed the example of the six; and in the middle of the day four more came to

me and professed their desire to become Christians. This was very encouraging. In the afternoon I delivered my last address in the school room, and at the close I asked my assistants to go about amongst the young men whom they knew to be well disposed and tell them that I invited all those who wished to become Christians to follow me to my tent, that I might say a few words to them in a body before I left, and that there might be a suitable opportunity for my taking leave of them and their taking leave of me. They assembled accordingly in my tent in the dusk of the evening, and it was with no less surprise than joy and delight that I found their number had increased to twenty-one! When I committed them into the hands of Jesus, all knelt in prayer as a token that they professed to become His disciples. Some of them, doubtless—perhaps most of them—may be expected to recede from their present position, through false fear or still falser shame; but as the movement seems to be extending their place may be more than filled up by new accessions. The leaders are, I have no doubt, influenced by real conviction, but some of the followers may perhaps only be swimming with the stream. Still it is a most interesting thing to know that such a stream has set in in so Brahmanical a town. It is a reason for much thankfulness to God; and results so unexpected and gratifying as those we have witnessed in this place during the last few days may well prepare us to attempt greater things and to expect greater things elsewhere in future."

"So far as I can discover the origin of the movement, it has taken its rise in the S. P. G. Anglo-Vernacular School. The influence of this school for good has much increased since the appointment about half a year ago of the present headmaster, whose teaching of Christianity has, it is said, been distinctive and decided, and whose efforts to draw the past and present pupils, and the young men of the town generally, to Christianity are said to have been unwearied. The young men and boys who had in this way come under Christian influences and who had yielded their minds to those influences had then influenced their parents and friends, some of whom stand at the head of the native community in the town, and they in turn had influenced the temple managers, the Brahmans, and the community generally. Thus wave after wave of influence seems to have emanated from the school."

Six of the young men referred to above have been baptised, two of whom were baptised by Mr. Rivington during his last visit.

Alleged failure of educational missions.

I do not attribute much weight to the statement frequently made that the educational system of missions has proved a failure. Such statements are always to be taken *cum grano salis*. People who wish to set forward any new system of missions in India too often commence by decrying the principles and work of those that have gone before them. But this is an unwise proceeding for the *nemesis* of events is too likely ere long to lead to their principles and work being in their turn unfairly decried. I remember the time when vernacular work was depreciated by the advocates of educational work. Now it is the turn of school work to be depreciated by the advocates of the latest novelty in Missions. The unbelieving world, however, is very impartial in the scorn with which it regards all mission work. It is commonly asserted by worldly people in India that Indian Missions altogether are a failure, and no person who has lived in India and read the Indian newspapers for any length of time can be ignorant of the prevalence amongst the English in India of the idea that Christianity itself has proved a failure.

CORRESPONDENCE.

TO THE EDITOR OF THE ENGLISH JOURNAL OF EDUCATION.

"IS THERE A SCIENCE OF EDUCATION?"

SIR,—To this question I have usually met with three answers:

(i) There is not.

(ii) It matters little whether there is or not, for what a teacher has to do is to teach not to speculate.

(iii) If there is, respondent is not aware of it.

The last proposition I have never had occasion to question, but the two former need consideration.

This morning I listened to a lesson in which the teacher sought to give a test for the equality of two angles. There was much that was satisfactory—probably far above the level of teaching as it is—pupils attentive, wishful to learn, beaming with animation, ready with answers; teacher knowing "his" subject, interested in imparting, having definite point in hand, winning in manner, method good—conversational, no telling. *Result*, failure; because knowledge sought to be produced, *not* produced.

Let us see why. Each pupil gave his answer, or rather answers, for the method being conversational (quasi-Socratic, not strictly Socratic), and intellectual life vigorous, the answers were abundant. The suggestions of pupils (as might be expected) consisted of vulgar every-day geometrical notions—result of their eleven to fifteen years' every-day observation of geometrical forms around them. Nature-teaching, together with the few scientific notions some had had the misfortune to pick up at school. Pr'chfor material for teacher, surely, who, nevertheless, stood staring, mentally (as it were) helpless, unable to act as a guide from this to the clean-cut, clear, distinct *scientific* notion he wished to produce—blind guide we must say, spite of his many virtues, after all.

Either answers given *could* not lead to the goal, and so the question should not have been proposed as unfit for pupils' actual condition, or teacher had not requisite skill to lead from actual mental condition to required mental condition, because:

(i) Unacquainted with elements of mental plexus presented—untrained in mental analysis.

(ii) Unacquainted with relation of *true* elements of this plexus to his own eliminated and correct *idea* (supposing him to have, as I do, correct idea).

(iii) Unacquainted with the genesis and growth of his own idea, or any other possible genesis and growth.

I contend that this particular case is a type of all teaching, and I wish to put this contention to a practical test; therefore I challenge any sceptic of the Science of Education, any bold asserter that Science of Education means quackery, and that what one has to do is to do and not "view," to give a successful lesson, lacking what this teacher lacked. Let the loser (him or me) hand over five pounds to an orthopedic hospital or other appropriate charity. I enclose card as evidence of good faith.

I will define my terms.

A successful lesson: The conscious producing in the pupil's mind, clearly and distinctly, a given idea of which the said pupil was not previously in possession, avoiding *unnecessary* intermediate ideas which must be regarded as waste of time, if not of energy.

Quality lacked by teacher. The knowledge (including intuitive knowledge) necessary for skill to lead *intentionally* from the pupil's actual ideas to required idea by the least circuitous route.

If my position is sound it follows that—

(*a*) There is always in teaching a *principle* that can distinguish successful from unsuccessful, good from bad, teaching.

(*b*) That such principle is *necessarily* founded on truths of the science taught and the action of the mind to be taught.

(*c*) That the teacher's artifices, schemes, processes, plans, may be various—should be various to meet circumstances and idiosyncracies of pupil and teacher—but that there can be but one *method* to ensure success.

(*d*) That this one method can be taught and learnt.

If this be true it follows that—

(*e*) There is a Science and Art of Education.

(*β*) There should be a Training of Teachers.

(*γ*) There can be a common test of work.

If so, what of Fifth Wrangler, who, *because* Fifth Wrangler is Head-Master, and, *by transplantation*, becomes a Teacher? What of the parent's twenty years' training in the City, constituting him a refined judge of how his son should be taught, and twenty years' experience in refining sugar how other people's sons should be taught? What of the priest whose Orders entitle him to judge your work and mine, my long-experienced, long-suffering, and short-paid brother?

Yours faithfully,

"HOC AGO."

BISHOP CORRIE'S GRAMMAR SCHOOL.

ON the evening of the 20th instant the Right Rev. Dr. Johnson, Bishop of Calcutta and Metropolitan of India, presided at the anniversary meeting of the above institution. Among the visitors present we observed the Right Rev. Dr. Gell, Bishop of Madras, the Right Rev. Dr. Sargent, Bishop of Tinnevelly, the Hon'ble J. G. Coleman, the Rev. Dr. Bower, Colonel Carnegy, Rev. G. Warlow, Rev. W. Miller, Rev. C. E. Kennett, Rev. J. Smithwhite, Rev. M. Goldsmith, Rev. M. Smith, Rev. A. H. Arden, Rev. W. Babington, Rev. J. Deedes, Dr. Brockman, Dr. Conran, Dr. John Bradshaw, Messrs. Bilderbeck, Houston, Lovery and Geedes.

The business of the evening began with the singing of the hymn *Onward Christian Soldiers*, after which Dr. Gell offered a short prayer. This was followed by the boys singing a song—*Red Leaves*. The Rev. A. W. Atkinson, M.A., Headmaster of the school, then proceeded to read his report for the past year. The following is the report:—

1. At the beginning of my Report last year I deplored the stern necessity that seems to be laid universally on workers in India of continually manufacturing statements of what they have done, and I glanced at what, even with my short experience of the usages of

the country, I thought a special hardship on us manufacturers, namely, the all but impossibility of imparting any flavour of novelty or interest to these oft-told tales. This year, however, in my opening paragraph, through your lordship's kindness I am enabled to refer to something new, almost if not altogether unprecedented I believe—I mean that feature of our Forty-third Anniversary which will render it a red-letter day in our memories and in the memories of all who cherish the traditions of this old Church of England School. It is a high privilege, and we most gratefully acknowledge it, that our annual gathering to-day is presided over by the Metropolitan of India—a most gratifying and also, if I may be permitted to say it, a not unfitting privilege—that this the oldest Church of England School in Madras, if not in India and as prosperous and healthy as it is aged, should be honored by having as President on this occasion the highest Officer of the Church of England in this great country. I have said that we gratefully acknowledge the honor you have done us, my lord, and I am sure that I am not reckoning without my hosts when I say that that "we" includes all—President, (our own revered Bishop) Committee, Masters, Parents and Boys. But may I venture, without any breach of good taste, to say for myself alone how deep a gratification it is to me personally to be permitted to read my Report to-day in your presence and hearing; all the greater because it is, as I can honestly say, a good and true report. It is just three years since I took charge of the School, and they have been years, all admit, of steady progress and prosperity. That I am able therefore on this occasion and in your lordship's presence to read my best Report as yet in India will be regarded not as a fortunate accident but as the natural result of honest, hard-work untiringly supplemented by my Assistants ever since the day I landed here, just three years ago, from the ship in which it was my happiness first to make your lordship's friendship and to be your fellow-passenger from dear Old England.

2. The number of withdrawals during the year ending December 31, 1879, was 61, that of admissions 85. The number of pupils on the roll at the present moment is 235, an increase on the very high total of last year's report, which total was 50 more than ever had been registered before. We certainly are advancing to the number, which I proposed last year as our limit, *viz.*, 350. But the advance is slower than I should have desired.

3. I repeat with added emphasis what I have already said: Bishop Corrie's Grammar School is capable of satisfying, and satisfying *well*, the wants of the entire community for which it exists in this section of Madras—just as I consider the Doveton Protestant College is capable of satisfying, and under its present Principal, most thoroughly satisfying, all the educational wants of similar community in that quarter of Madras, in which *it* stands. Here in our neighbourhood, I know, it is often said by parents in reference to their little boys—"We'll send them to Bishop Corrie's as soon as they are able to take their place in a higher class and can really benefit by the superior teaching given there, but until such time we do not think it is worth while to pay the higher fee for them." Now I beg to say thus publicly in my Report that such a reason for withholding their younger boys from us no longer exists. I organised a Primary School more than two years ago in immediate connection with our Grammar School in order to meet this difficulty, so that it might be a fit feeder to our Middle and Upper School. With the approval of the Committee I graduated the fees [illegible] by little boys to their standing in the classes of this Pri[illegible] School. I maintain therefore that there no longer exists any rea[illegible] why parents should keep back their boys from us until they [illegible] grown big enough to be worth paying the higher fee for. Even supposing the boys who come to us from the smaller schools [illegible] about us were thoroughly well grounded in those schools, which [illegible] by no means admit they are, still the change of system and routine [illegible] which they are subjected, necessarily subjected, when they join us, [illegible] ders their progress not to speak of their having missed, during two or three of the years when they are most easily moulded, the pers[illegible] influence which Head Masters such as have, for the most part, [illegible] ed Bishop Corrie's can bring to bear, if they are worth anything, [illegible] very class in the school from the highest to the lowest.

4. The Primary School has been an emphatic success as will be admitted when I say that there were 11 boys in it when I began and there are now 84; but the number is not at all yet what I want it to be. It is *here* (in the Lower Department) where we can lay a solid foundation that I want especially to see the increase in numbers which will bring our total up to the limit I have proposed to myself, *viz.*, 350 boys. Before leaving the subject of the Primary School I ought to say that, under instructions received from the Educational Department, an examination styled the Upper Primary School Examination was held in the beginning of December last and that of the pupils examined 25 (twenty-five) passed. The name of each of the successful little boys was *Gazetted* and he became entitled to a Certificate from me stating that he had passed the examination, and specifying in what subjects he had passed. About the same time under similar instructions an examination of the Lower Primary Class was held and, of the pupils examined, 12 passed. Each of these also became entitled to a Certificate though *not* to a place in the *Gazette*. The notification sent out from the Educational Department requires the Principals or Head Masters of Aided Institutions to accept these Upper Primary and Lower Primary Certificates as sufficient evidence that the children possessing them are fit, without any further examination, except in the case of English or a Vernacular, to be admitted into the Middle School and into the Upper Primary School respectively of any Government or Aided School. I do not know whether it is possible, these Primary School Examinations being conducted as they are, to secure that each of these little holders of Certificates shall have reached the same standard, say in such an important subject as Arithmetic, I rather think it is not possible. For though the number of Rules in Arithmetic is prescribed, still the character of the questions asked to test the pupils is left to the different Headmasters or Headmistresses, and I am inclined to believe that the character of such questions will vary with *their* varying estimates of what is to be expected from their pupils. In some cases that have already come before me I was not disposed to accept the Certificate presented, because I did not think it represented a standard equal to that which I have required from my classes, and probably I am not singular in this indisposition.

5. I may as well refer here to another new Examination that was

instituted last year, *viz.*, Middle School Examination. It was notified to us early in the year that the holding of such an Examination was intended but as the months ran on and no further orders on the subject were issued I, and I have no doubt others also, thought that the intention would not be carried into effect till the end of the next year. But on the 31st October it was notified that the Examination would be held on the 6th January 1880. Almost all the boys of our Upper IVth class presented themselves and eleven passed, one in the First Class and ten well up in the Second. It told heavily against our boys and against boys from other schools such as ours that, in the Syllabus of subjects appointed, whether optional or compulsory, no place was given to Latin. Owing to this, and in order to qualify in a sufficient number of subjects, they had to take up at very short notice a subject entirely new to them, *viz.*, Physical Geography, and I fear that, simple as the Examination proved to be in this subject, they did not acquit themselves very satisfactorily. Next time, however, we hope to do better, but I trust some modification of the Syllabus will be adopted by the Educational Department which will enable our boys to present themselves in a subject to which we devote so much care and time as we do to Latin, and which I shall continue to devote the same care until I am shown that some knowledge of Latin is not essential to a boy's thorough grasp of the force of English words and to his clear apprehension of the construction of sentences. Just one word more in connection with these new Examinations added on to all we had before. I hope I shall not be thought guilty of presumption when I say that these multitudinous Examinations are becoming a continual nightmare to us Teachers, at any rate I speak for myself; and I do not suppose they are less objects of anxiety to the Examinees. I do not speak with any levity but with honest sincerity when I say that I sometimes cast a pitying eye round the happy-faced little boys in our lower classes when I think of the long series of tests they have before them, and I piously though silently hope they wont be examined off the face of the earth before they reach maturity.

6. The Good Conduct Prizes are awarded this year thus :—In the Upper School to James Lychlander; in the Middle School to E. Evans; and in the Primary School to G. B. Fitzsimons. The President of our School Committee, The Lord Bishop of Madras, has most kindly given the Good Conduct Prize in the Upper School and the Hon'ble D. F. Carmichael has with equal kindness given that in the Middle School. The Medal in the Primary School is, as usual, given by myself. The Boys who win these Good Conduct Prizes in the several departments of the school are elected for the honour by the votes of their class-fellows, ratified of course by the approval of myself and my Assistant Masters.

7. The winners of the Maitland Scholarships this year are,—

First—James Lychlander.

Second—Thomas William Stewart.

I beg to return my best thanks to the kind friends who gave their valued help in examining the Candidates for these Scholarships, *viz* :—

Book of Common Prayer.....Rev. W. M. Babington, M.A.
English.....J. B. Bilderbeck, Esq., B.A.
Indian History.....W. L. Bower, Esq., B.A.

Mathematics.....J. Cook, Esq., M.A.
Geography.....J. Cook, Esq., M.A.
Scripture.....Rev. W. Johnson.
Latin.....Rev. J. Smithwhite, M.A.

I have to acknowledge gratefully the further kindness of the Rev. J. Smithwhite, who not only gave the Candidates for the Maitland Scholarships an examination in Latin on paper, but also most kindly examined our lower class in the Middle School in the same subject *viva voce*. His report at the conclusion of the examination was that he had rarely, if ever, examined a class that had afforded him such entire satisfaction, the answering of almost every boy bore evidence of such sound and careful teaching.

8. The School was examined by the Government Inspector at the end of October last. His report may be read *in extenso* as it is printed with our school report. That the inspection found us in a state of thorough efficiency I suppose all will admit who take the trouble to read through Mr. Fowler's review of our classes. No words of mine could enhance the value of the brief but expressive criticism made by the Director of Public Instruction on the Inspector's Report being submitted to him. I quote his words from the 'Proceedings of the Director of Public Instruction,' bearing date 20th January 1880 :—'This Report shows that Bishop Corrie's Grammar School is in a very satisfactory condition. The attention paid to paper work is deserving of special commendation.' This valuable and gratifying criticism on the character of that portion of our school work which I can guide and control is followed by a paragraph commenting on the Tamil teaching of our school—an utterly unsatisfactory subject to me. In my Report of last year I wrote at some length on the matter and I concluded what I had to say by recommending that the Committee should banish the subject from our curriculum, because, as it seemed to me, it was impossible to attain even an approximation to results such as would repay us for the time and money devoted to it. What I said then will probably be remembered by many here. That the classes made no progress in the subject I attributed mainly to the fact (it is a fact) that the Vernacular is despised by our boys and their parents generally; but I also said that a further reason for the miserable rate of progress or rather no progress, was that a Native teacher seemed unable to hold a class of boys, such as ours, under anything like proper discipline. You will remember perhaps the illustration whereby I thought I could best convey the situation to some of my hearers. I asked you to accept my assurance that a Moonshee is the oriental analogue of a French master amongst English boys. The Committee did not act on my advice last year and another year has dragged its slow length miserably along with the same unsatisfactory result as regards this subject. I am now disposed to add to the two reasons for the unsatisfactory result already quoted, another one, namely, the faulty method of teaching the language. Perhaps I am not competent to give an opinion on this phase of the matter as I do not pretend to know anything of the language, but I know that, if I attempted to teach Latin, Greek or French according to the method I observe, so far as I understand it, I should never succeed in making a boy know those languages in any useful way. The criticism therefore of the Director of Public Instruction on his

Inspector's Report on this subject, *viz.*, 'The arrangements made for teaching Tamil seem susceptible of improvement,' appears to me worthy of the careful consideration of the Committee if they intend me to keep it still amongst the subjects of our curriculum.

9. Of the boys from this school who presented themselves for the University Matriculation Examination last December seven passed, all in the Second Class—a result which I confess was somewhat disappointing to me not only because of the smallness of the number that succeeded in passing, but also because those who did pass, were all placed in the Second Class. I fully expected that at least two of our boys would be well placed in the First Class. Well, we'll try to do better next time.

10. At the last Cator Examination ten of our boys obtained Certificates and one, James Lychlander, won a money Prize of Rs. 30.

11. For the first time in the history of our school I am enabled this year, with the approval of the Committee, to give some prizes to the best boys of the two highest classes got up in special binding which marks them as having been won in this Grammar School. I think it desirable by every means to try and keep green in the hearts and affections of school boys the memory of their old school, for I know, by experience such as probably many here have shared, that the sight of an old school prize in after years has power to awaken some of the happiest and brightest recollections of the long vanished past associated as they are with the friendships and struggles and victories of school life.

12. In conclusion I must beg to tender my best thanks to the Committee of the school who, throughout the three years' term just ended, have so ungrudgingly and cordially supported me in all my work,—to the Honorary Secretary whose courtesy and long Secretarial experience have tended to make my relations with that Committee so uniformly happy—and though last not least to my Assistant Masters, whose devotion to the interests of their pupils, loyalty to the character and traditions of the school, and faithful efforts to carry out all my plans and suggestions have maintained our good name and deserve the frankest recognition. "Nothing succeeds like success" is a French saying as true as it is terse, though perhaps a little cynical. That we shall do our utmost by conscientious work to deserve and perpetuate the success and popularity that have, hitherto, through all the years of its history, attended our school, I know that I can promise as well for my Assistant Masters as for myself. This being so may I not ask your hearty response to a prayer for the continuance of the prosperity and high character which this old Grammar School enjoys and, applying to it, as a classical quotation, words that form the motto of one of the most famous schools in England may I give you as the last words of my Report this year, *Stet fortuna domus!*

'Forth to the Battle' was then sung, and the Metropolitan distributed the prizes and medals to the boys. The song 'Those Evening Bells' was next sung. It may be mentioned in connection with the prizes that the headmaster, in accordance with a promise made by him to double the amount of money-prize which any Corrie boy might have won at the Cator examination, handed to the lad who won a money prize of Rs. 30 at the late examination, the amount which he had promised.

The Chairman then addressed the meeting. His Lordship said that he had but few words to say about the report. But before he did so he wished to thank Mr. Atkinson, the headmaster, for asking him to preside at the anniversary of this school. His Lordship and the headmaster were passengers in the same vessel to India about three years ago, and during the voyage he noticed the anxiety of Mr. Atkinson to enter upon the duties before him and to take upon himself the responsible charge of a large school. He had, he would say, landed in India simultaneously with Mr. Atkinson, and at that time he expressed his desire to inspect Bishop Corrie's. That desire, he thanked God, he was able to accomplish, and he congratulated Madras, the boys of the school, their parents, the public and the Committee on the possession of such a flourishing institution. Mr. Atkinson had told them that it was rather hard work upon headmasters of schools to manufacture reports every year of the work done by them; his lordship felt the same difficulty in manufacturing addresses, for during his long tour of inspection he was compelled to visit schools, attend meetings and deliver addresses, and he found it hard work to say something new or pleasant. In the report read by Mr. Atkinson, he thought he found a good deal that inspired new thoughts, and there was something to say. The school had been established in honour of an eminent man, and the report of its working was satisfactory. He had read the report carefully and found it difficult to pick any holes in it. Nothing in it needed remark more than the subject of Vernacular education. Last year Mr. Atkinson expressed, in his report, a desire to give it up, so unsatisfactory were the results. This year, however, there was a slight change in his opinion, and his Lordship for his part was sure that the little difference between the opinion expressed by the Director of Public Instruction and the Committee about examinations would be satisfactorily settled between themselves. On the general subject of education he would wish to make a few remarks. The subject uppermost in men's minds was education and employment. The question now before the public was this—Whether it was better to educate with a view to obtaining employment, and on the other hand if education was imparted, where was employment to be found. Some of those engaged in the work of education said—We will educate our pupils if the Government or the public tell us where employment would be found for our pupils. The State on the other hand says, Educate, and the pupils are sure to find something to do. But the educationists assert that things have come to a dead lock, all the avenues for employment are filled, the road is impassable, in fact, they said that the present state of affairs was very much like two men trying to pass from opposite directions through a very narrow passage. His Lordship next confessed that the subject was just now receiving a great deal of attention. In Madras this subject had engaged the attention of a large number of people. The Anglo-Indian and Eurasian Association had taken it up, and his Lordship was sure the Committee would deal with the subject fully and satisfactorily. His Lordship would tell the boys of Bishop Corrie's School to-day, their parents and the masters, that it was his opinion that education was all that was needed. "Educate your boys," said the Right Reverend Chairman, "and they ought to pave their way into the world." That idea he would forcibly impress upon all present

and all those entrusted with the education of children, and he was sure that by God's help they would be able to get on. He was well aware of the difficulties that presented themselves in the work of educating the young, he was aware that pupils of schools had many examinations to pass, but he would urge that boys be trained to pass them, and it was left to parents and masters to encourage their boys. Nothing was more deplorable than to discourage the young—it would be a damper on their energies, self-reliance would go and with ill-success evil would come. He would impress upon the minds of parents especially to make their boys feel that the struggle in school would lead to something grand, and that if a boy was successful in life, he would be all that he was destined to be. Much of the success in life of a boy depended upon the spirit in which parents brought him up. Every opportunity should be taken, by example and by precept, to tell him that it was a grand thing for a man to be successful in life, that success depended chiefly upon one's own endeavours, and every boy should be so trained as to be able to say to himself, "I will be a man and make my own way in the world." Of late much attention had been given to industrial training. His Lordship had visited the Madras Industrial School and was pleased to see it in a satisfactory condition. But in giving industrial education book-learning should not be omitted. Both should go hand-in-hand. Lads ought to be taught a trade as well as to pass an examination—they should be capable of taking up a trade when they could find nothing else to do. If schools turned out boys to take up work, good and useful men might be trained up, the system of instruction would percolate, and with perseverance success must come. His Lordship then related a circumstance which came within his observation, and which shewed what great value some people placed on education. When he was a curate, his Lordship visited a member of his congregation, who was a fairly successful shoemaker. The shoe-maker's children were not very well clad—they were not in rags, but were no socks and shoes. He asked the shoe-maker why he did not provide his children with shoes, and the reply he got was that much did not depend on stockings and shoes, but that all that was necessary in this life was good feeding and education, and while the shoe-maker did not stint his children in these, he thought that they could at times do without boots. The shoe-maker, his Lordship said, was not wrong. Let people follow the system he adopted, give their boys a liberal education and while the mind is made to work, let the body have sufficient exercise and fine healthy, intelligent, robust young men will thus be turned out. His Lordship did not know if gymnastic were practised by the boys; (the Headmaster informed his Lordship that there was a gymnasium attached to the school); he was glad to hear that athletic exercise was encouraged and he thought that every encouragement should be given the pupils in physical exercise. Following in the wake of his lamented predecessor, Bishop Johnson had founded a prize at the Martiniere school in Calcutta for the 'best all round boy.' The system pursued in that school he thought should be largely followed. The boys should be told invariably that the money spent in their instruction is so much capital, and that nothing should deprive them of it. Before closing his remark his Lordship said that he would again refer to the subject of employment and urge upon the boys of

Bishop Corrie's to mark out courses for themselves. The resources of the country were great, there were many spheres for employment open, and if people would look about they would find enough to do. Some boys seemed to have no other idea in them after school days were over than that life consisted of appointment and salary. He hoped that the boys taught in this school would have instilled into them the idea that they were created for a nobler purpose. To some emigration to Australia and to other lands seemed to be one way of becoming successful. His Lordship had no great faith in emigration schemes. He related how a young man from England went to America and how, after he got there, he wrote in glowing terms of the land of liberty. But he soon changed his tone and was glad to return to England. Emigration, he thought, could not solve the question of employment, and there were many better ways of people earning honest livelihood here than going to seek it elsewhere. There were among us many weakly ones and they should be encouraged and supported to the best of our ability. Education, said his Lordship, was a subject in which he evinced the deepest interest. He wished the boys, the masters, the Committee, and all interested in the work of this school success, and by God's blessing he sincerely hoped that with the instruction imparted to the boys in this school they will, after leaving it, fight the battle of life successfully.

His Lordship concluded his address amid loud cheers, at the close of which the Rev. C. J. Kennett, an old Corrie boy, thanked the Metropolitan for presiding. His Lordship said that he was pleased to find that his services that evening were so highly appreciated, and he hoped that Bishop Corrie's School would, in course of time, turn out many Kennetts.

The benediction was pronounced by Bishop Johnson, and the singing of the national anthem brought a very successful meeting to a close.

As the Metropolitan was leaving the chair, the boys cheered him loudly.

At the request of the Bishop of Madras, the boys gave three cheers for their Headmaster.

THE TRAINING OF TEACHERS.

By the Rev. R. H. Quick.

(Continued from page 48.)

But still, I fancy I hear the objector say, "Suppose we take theory for the actual truth of the thing, this truth may really give its possessor no practical advantage. Do you think that if we all studied the structure of the eye, and the undulatory theory of light, there would be any falling off in the sale of spectacles?" But the objector has now ceased to urge that a knowledge of theory is an evil. If nobody sees the better, nobody sees the worse, for understanding the structure of the eye and the undulatory theory, so the knowledge is at least harmless. And in point of fact, theory, even in the matter of light, often leads to considerable practical gains; and I believe some valuable optical instruments, among them the stereoscope,

were deduced direct from theory, not experiment. In the matter of education, too, I hope to convince those who have the patience to listen to me, that knowledge of theory is not only harmless, but fruitful of great practical advantages.

Perhaps I had better explain what I mean by the theoretical, and what by the practical knowledge necessary for the schoolmaster. The first must include all the knowledge he can get of what his task is. The second refers not to the task itself, but to the means by which it may be performed. Conformably with this division, I purpose first considering how the schoolmaster may get a fit conception or theory of the task he undertakes.

Mr. Lowe has told us that there is no such thing as a science of education, and though I very seldom am able to agree with him, I must do so here. But though we have not as yet a clear and well-established *rationale* of our employment, we are, I maintain, gradually advancing towards one; and there is already sufficient truth arrived at to make us hopeful for the future. A rapid sketch of the progress of thought on this subject will show the direction in which the truth seems to lie.

"The boasted Athenians," said Dr. Johnson, "were barbarians. The mass of every people must be barbarous where there is no printing." Here we have the root idea which, in spite of the schoolmaster's idolatry of these very Athenians, has dominated education ever since "the revival of learning." However, with all my respect for Dr. Johnson, I have not the least doubt in the world that the Athenians were the most highly educated people that ever lived. The plays and poems and orations which are now the delight of a few intellectual scholars, who alone are capable of rightly appreciating them, were then the ordinary amusements of the people. Compare the popular pieces at our London theatres with the tragedies of Aeschylus or Sophocles, or even with the comedies of Aristophanes; compare still more the speeches of counsel to English jurymen with the marvellously close arguments which Demosthenes put into the mouths of ordinary citizens to address to their fellow-citizens (I mean in the private orations), and then determine which people should be called educated and which barbarians. Yet the Athenians were educated, for the most part, without knowledge and without books. How, we are tempted to ask, was education possible in such circumstances? And yet, as it proved, education was possible, and a wonderful result was obtained. Maybe, Athenian education owed its excellence to the educator's theory of his task. The Athenian's love of beauty led him to seek harmonious development of the whole man, without thinking of any separation of mind and body.

This separation was first brought about by ascetic forms of Christianity, and in the Middle Ages the body seems to have had little care bestowed upon its education. As for the mind, in the Middle Ages the stock of knowledge was small, and such education as there was aimed at giving not so much knowledge as skill in intellectual fence. The perfectly educated man could, like Picus of Mirandola, challenge all comers to dispute with him *de omni scibili*, on everything knowable.

Then came the "Revival of Learning." I am inclined to think that that great movement has not been very fitly named. *Learning* in fact was not revived but invented, or at least raised to a position it had never held before. Astounded by the beauty of the great

literary works of antiquity which were now spread over Europe by the new art of printing, all active minds devoted themselves to the study of the classics. Wisdom and culture were to be found in these alone, and education became another name for the study of Latin and Greek. Up to that age Man had been conceived of primarily as a doer and thinker. Henceforth he was to be first and foremost a learner.

Many great schools were founded in that age, and indeed owed their foundation to enthusiasm for learning, but they did not start under favourable influences. The Middle Age bequeathed its contempt for the body, and also its harshness towards the young. There is no exaggeration whatever in saying that a dog in our time is treated far more humanely than a boy was treated in the sixteenth century. Then, again, as nothing was cared for but knowledge of the classics, *children* seemed incapable of education, and even youths could not enter into the sense of the classical authors, so they were kept to a preparatory grammar and linguistic course, which would at least give them the key of the storehouse by the time they were old enough to enter it. Shakespeare describes the school boy as whining and creeping unwillingly to school, and no wonder he went so unwillingly. He would be confined within those narrow walls for ten hours of the day, and would probably have flogging added to imprisonment. And in all these tedious hours there was provided, as Cowper says—

> "No nourishment to feed his growing mind,
> But conjugated verbs and nouns declined."

When we consider the ordinary grammar school education of those days, we must admit that narrow and faulty as was the schoolmaster's theory of education, his *practice* was even worse still. His theory, his view or estimate of his task was, that he had to teach his pupils Latin and Greek, and he failed to do even this, for he went very clumsily to work.

Then came the Jesuits. They were far too much bent on popularity to think of attempting a new education. They accepted the *current theory* of the schoolmaster's task, but they made great improvement in their way of executing it. The monstrous length of the school time was reduced by them *from ten hours to five*, a startling innovation. The harshness of treatment which has lingered in our schools almost till the present day, was at once abandoned by them. The Jesuits *treated* the boys with uniform kindness. Their great writer, Sacchini, admonishes the master to aim at combining in his manner the father's dignity with the mother's tenderness. "*Boys will soon love learning when they love the teacher.*" "It is the unvarying decision of wise men," says Sacchini again, "whether in ancient or modern times, that the instruction of youth will always be best where it is pleasantest; and so the Romans have the same word for *school* and *game*." Thus the Jesuits sought to make learning "not only endurable, but even pleasurable." But as I said, they accepted the theory of their time, and aimed at giving a thorough grammatical knowledge of the ancient languages. Thoroughness was the great characteristic of their teaching. The quantity taught was small, but they always hammered away till the nail was driven home. It has been well pointed out by Mr. Eve, the head-master of the University College School in London, that young masters think

chiefly of stimulating their pupils' minds, and are apt to neglect repetition and accuracy of attainment, while on the other hand, old masters lay much store by accuracy that they go over and over the same thing till the pupils lose zest and mental activity. Now the Jesuits openly and candidly adopted this latter practice. Their motto was "Repetition is the mother of studies," and they sought to make learning pleasant, not in itself, but by external forces. As I mentioned, the school hours were to be very short, two-and-a-half hours in the morning, and the same in the afternoon; and to induce the pupils to work hard while they were in school, the Jesuits adopted an elaborate system of stimulating emulation in every possible form. Every boy had a special rival allotted to him, and the dullest work was turned into a kind of game by letting the boys pick up sides, as the school phrase is, and have pitched battles of question and answer, with the master for umpire. Up to this point you will observe that the Jesuit innovations I have mentioned have been practical, have referred, *i. e.*, not to the thing to be done, but to the means of doing it. But the Jesuits, while accepting the theory of their time, did make some improvements in it. They did not hold with the Sturms and Trotzenderfs, that the classics in and for themselves were the object of education, so they thought of other things too. They called for physical development, and paid much attention to bodily health. And they enlarged the task of the schoolmaster in another way. To the best of their light they attended to the moral and religious training of their pupils. It is much to the credit of the Fathers that though Plautus and Terence were then considered very valuable for giving a knowledge of colloquial Latin, and were studied and learned by heart in the Protestant schools, the Jesuits rejected them on account of their impurity. The Jesuits thought that the whole boy should feel the influence of the master, not merely his memory, so the master had to study each of his pupils, and to do this he went up to the school with the same set of boys, as the plan is now in Scotland.

The Jesuits have been the most successful teachers ever known. At the beginning of the seventeenth century they were in such repute, that as Mark Pattison tells us, they could dare to treat even a Casaubon who had not been in their schools as an uneducated person. And they owed their success to two things: they had a clear conception of what they wanted to do, and by their wonderful organization they economized all their forces, and made everything tell in carrying out their plans. Theirs was the only school system elaborately thought out and worked as a whole. The individual schoolmaster withered, but the system grew, and was, I [illegible] *is*, a mighty organism. The single Jesuit teacher might not be the superior of the average teacher in good Protestant schools, but by their unity of action the Jesuits triumphed over their rivals as easily as a regiment of soldiers scatters a mob.

We have next to consider two men who had nothing to do with the practice of education, and treated of theory only; but if theory is our conception of the thing to be done, any change of theory must in the end involve changes in practice as well; and perhaps in education, as in other things, the truly important people for us are those who affect our thoughts. There are in the world, as Goethe tells us, but few voices, though many echoes; and my object in this hasty

sketch is to determine, as well as I can, which are the voices, and what they say to us.

We have seen that the schoolmaster's theory of the human mind was one of it, to use Bardle Massey's simile, a kind of bladder fit only to hold what was poured into it. This pouring-in theory of education was first called in question by that strange genius who seems to have stood outside all the traditions and opinions of his age,

"holding no form of creed,
But *contemplating* all."

I mean Rabelais.

Like most reformers, Rabelais begins with denunciations of the system established by use and wont. After an account of the school teaching and school books of the day, he says—"It would be better for a boy to learn nothing at all than to be taught such-like books by such-like masters." He then proposes a training in which, though the boy is to study books, he is not to do this mainly, but is to be led to look about him, and to use both his senses and his limbs. For instance, he is to examine the stars when he goes to bed, and then to be called up at four in the morning to find the change that has taken place. Here we see a training of the powers of observation. These powers are also to be exercised on the trees and plants which are met with out of doors, and on objects within the house as well as on the food placed on table. The study of books is to be joined with this study of things, for the old authors are to be consulted for their account of whatever has been met with. The study of trades, too, and the practice of some of them, such as wood-cutting, and carving in stone, makes a very interesting feature in this system. On the whole, I think we may say that Rabelais was the first to advocate training as distinguished from teaching, and he was the father of what the Germans called *Anschauungs-unterricht*, instruction which the pupil gets by his own senses and experiences. Rabelais would bestow much care on the body too. Not only was the pupil to ride and fence; we find him even shouting for the benefit of his lungs.

Rabelais had now started an entirely new theory of the educator's task, and fifty years afterwards his thought was taken up and put forward with incomparable vigour by the great essayist, Montaigne. Montaigne starts with a quotation from Rabelais—"The greatest clerks are not the wisest men," and then he makes one of the most effective onslaughts on the pouring-in theory that is to be found in all literature. His accusation against the schoolmasters of his time is twofold. First, he says, they aim only at giving knowledge, whereas they should first think of judgment and virtue. Secondly, in their method of teaching they do not exercise the pupils' own minds. The sum and substance of the charge is contained in these words—"We labour to stuff the memory and in the meantime leave the conscience and understanding impoverished and void." His notion of education embraced the whole man. "Our very exercises and recreations," says he, "running, wrestling, music, dancing, hunting, riding, fencing, will prove to be a good part of our study. I would have the pupil's outward fashion and mien and the disposition of his limbs formed at the same time with his mind. 'Tis not a soul, 'tis not a body, that we are training up, but a *man*, and we ought not to divide him."

The beginning of the seventeenth century saw the rise of a new philosophy which had great influence on educational theory. In the sixteenth century the only knowledge cared for was knowledge of the old literatures, but this exclusive devotion to books was followed by a reaction. There might after all be something worth knowing that books would not teach. Why give so much time to the study of words and so little to the observation of things? "Youth," says a writer of the time, "is deluged with grammar precepts infinitely tedious, perplexed, obscure, and for the most part unprofitable, and that for many years." Why not escape from this barren region? "Come forth, my son," says Comenius, "Let us go into the open air. There you shall view whatsoever God produced from the beginning and doth yet effect by nature." And Milton thus expresses the conviction of his day: "Because our understanding cannot in this body found itself but on sensible things, nor arrive so clearly to the knowledge of God and things invisible as by orderly coming over the visible and inferior creature, the same method is necessarily to be followed in all discreet teaching."

So there was strong discontent with the ordinary school course, and everything seemed ripe for a change. Then arose a band of Reformers, whom the Germans call *die Neuerer*, a name which we mostly render by "the Innovators." This word, although it may be fitly applied to most of the great benefactors of mankind, has a somewhat unpleasant sound in our ears. There is a sentiment rather than a principle of Conservatism in us which leads us to disparage innovators, and call new things new-fangled. Lord Beaconsfield, a great artist in words, once assured the House of Commons that some plan of his, though new, was not new-fangled, and the House was so much impressed that it unfortunately neglected to ask the difference, nor has anyone, as far as I am aware, been able to discover it. For myself, I must own that I share the prejudice against novelty to this extent, that I am always glad to leave well alone; but in education, at all events, much that is new, not to say new-fangled, must yet be thought and done before we can have any reasonable ground for contentment; and we are already so much indebted to those who have had the courage to burst the bonds of use and wont, that I would on no account speak disrespectfully of them. If then I call the *Neuerer* Innovators, I must be understood to use this word as a title of honour.

One reason which has made us so distrustful of innovators is, no doubt, that they have been for the most part unsuccessful, or have, at least, seemed so to their contemporaries, who contrasted the *promised* results of their reforms with the actual. The first of the Innovators, Ratky, when he had all the means provided for him for carrying his plans into execution, failed so conspicuously, that the prince who had been his patron threw him into prison as an impostor, and would not release him till he had signed a paper admitting he had undertaken more than he was able to perform. But this apparent want of success must not lead us to underrate the Innovators' importance. The wisest innovator always runs great risk of failure. It is safe to adopt the current theory like Sturm and the Jesuits; it is safe to speculate how that theory should be altered, like Rabelais and Montaigne; but it is dangerous to be Innovators, *i. e.*, to attempt to translate new thought into new action, and boldly to advance without a track, trusting only to principles, which may, like the compass, shew us the right direction, but which also like the compass, will give no hint of the obstacles to be surmounted.

The Innovators did not shake themselves free from the Renascence conception which made knowledge all-important. Indeed, in this respect they were not as far advanced as Montaigne. But they saw that the schoolmaster was failing even according to his own conception of his task. The classical authors were so difficult that few ever got to understand them, and thus the years spent in the school-room were for the most part wasted, for they were spent in getting the key to the storehouse, and not one pupil in a hundred made any use of it. Meanwhile really useful knowledge, knowledge of the world in which we live, and of what goes on in it, and how we are related to it, was entirely neglected. The Innovators, therefore, proposed to give a new kind of knowledge, a knowledge of *things*. "Not words, but things," made a very excellent cry, which was used with great effect, and as mostly happens with a variety of meanings, perhaps even on occasions with no meaning at all.* But in whatever sense it was understood the cry was taken up and repeated by many eminent men, who were as dissatisfied with the schools of the seventeenth century, as our eminent men are with those of those of the nineteenth. Pope makes the schoolmaster say—

> "Then thus since Man from beast by words is known,
> *Words* are Man's province, *words* we teach alone."

And Milton says, "Though a linguist shall pride himself on having all the tongues that Babel clove the world into, yet if he have not studied solid things in them, he were nothing so much to be esteemed a learned man as any yeoman or tradesman competently wise in his native dialect only."

So the principal feature in the things which the Innovators was the necessity of giving a knowledge of things. In some respects they were, as I have already said, not so far advanced as Montaigne, for he had declared that judgment and virtue should be cared for before learning, whilst the Innovators still thought mainly of giving knowledge, and most of their proposals refer either to the subjects of instruction, or to the method of teaching.

But towards the middle of the century a very eminent Innovator took a comprehensive view of education, and reduced instruction to its proper place, that is, he treated it as a part of education merely. This man, Comenius, was at once a philosopher, a philanthropist, and a schoolmaster; and in his writings we find the first attempt at a science of education. The outline of his science is as follows:—

"We have a threefold life—a vegetative, an animal, and an intellectual or spiritual. Of these, the first is perfect in the womb, the last in heaven. He is happy who comes with healthy body into the world, much more he who goes with healthy spirit out of it. According to the heavenly idea a man should—1st. Know all things; 2nd. He should be master of things and of himself; 3rd. He should refer

* The two principal senses in which the antithesis may be employed are, I should say, 1st. To distinguish knowledge of language, as such, from knowledge of meaning and mental conceptions, whether conveyed by language or otherwise; 2nd. Keeping to the narrower meaning of the word things, we may speak of the knowledge of material objects as the knowledge of things and then "words" will stand for all other knowledge.

everything to God. So that within us Nature has implanted the seeds of learning, of virtue, and of piety. "To bring these seeds to maturity is the object of education. All men require education, and God has made children unfit for other employment that they may have time to learn."

Here we have quite a new theory of the educator's task. He is to bring to maturity the seeds of learning, virtue, and piety, which are already sown by Nature in his pupils. This is quite different from the pouring-in theory, and seems to anticipate the notion of the last great educational reformer, Froebel, that the educator should be called, not *teacher*, but *gardener*. But Comenius evidently made too much of knowledge. Had he lived two centuries later he would have seen the area of possible knowledge extending to infinity in all directions, and he would no longer have made it his ideal that man should know all things.

The next great thinker about education—I mean Locke—seems to me chiefly important from his having taken up the principles of Montaigne and treated the giving of knowledge as of very small importance. Montaigne, as we have seen, was the first to bring out clearly that education was much more than instruction, as the whole was greater than its part, and that instruction was of far less importance than some other parts of education. And this lies at the root of Locke's theory also. The great function of the educator, according to him, is not to *teach*, but to *dispose* the pupil to virtue first, industry next, and then knowledge; but he thinks where the first two have been properly cared for, knowledge will come of itself. The following are Locke's own words:—"The great work of a governor is to fashion the carriage and to form the mind, to settle in his pupil good [illegible] and the principles of virtue and wisdom, to give him little by little a view of mankind and work him into a love and imitation of what is excellent and praiseworthy; and in the prosecution of it to give him vigour, activity, and industry. The studies which he sets him upon are but, as it were, the exercise of his faculties and employment of his time; to keep him from sauntering and idleness; to teach him application [illegible] accustom him to take pains, and to give him some little taste [illegible] what his own industry must perfect." So we see that Locke [illegible] with Comenius in his enlarged view of the educator's task [illegible] that he thought much less than Comenius of the importance of [illegible] knowledge to be given.

(To be continued).

MISCELLANEOUS.

OLD WORDS.—"The gradual decay of old words is most mournful, their meanings seem to become more and more restricted. How narrow a sense has *sake* (causa) in our day, compared to what was its old power! *Loom* once stood for any household utensils; it is now restricted to the weaver's trade; we also talk of *heir-looms*. The word *thing*, in its sense of *causa*, remains in our phrases, 'I would not for anything,' 'but for one thing.' The phrase, 'to hear the *rights* of it,' remains to show that *riht* in old English would represent *veritas*. The *tale* told by Milton's shepherds may bear two senses, as we know. The old *wright* (faber), still common

in Scotland, has died out in England, except in the compounds *wheel-wright*, *ship-wright*, and such like. The old *sibb* (affinis) survives only in *gos-sip*.

"It is curious to see more than one meaning given to an English word, and to know that these meanings run very far back. Thus *weather* had a second sense, that of *procella*; this is kept alive by the saying, 'Fear neither wind nor weather.' Thus also *man* has always borne something like the sense of *servus*, as well as that of *homo*; it implies inferiority; an officer or a farmer speaks of his *men*. The old *weorc* meant *dolor* as well as *opus*; the former sense remains in, 'I had sad *work* with him.'

"When we speak of a *fish-wife*, we bear witness to the fact that *wife* has always meant *mulier*, as well as *uxor*. The different meanings of [illegible] *hallan* means *tribuere* as well as [illegible] still means both *torquere* and [illegible], and of old it [illegible] *solvere*. It is curious that *letan* (let) should have always [illegible] contradictory meanings of *sinere* and *obstare*. We may now both *drive* a trade and *drive* cattle; either sense dates from early times. We have good sanction both for *sticking* pigs, and for *sticking* to a friend. *Find* has always had the sense both of *invenire* and *providere*; 'you must find yourself.' The adverb *fæste* has from the first had two meanings; a Frenchman once complained that in England a horse was said to be *fast* when galloping, and also *fast* when tied to a gate."—*Oliphant.*

EXTENSION OF UNIVERSITY TEACHING.—Though Scotland, with its four popular Universities, has set a noble example in placing the means of intellectual culture within the reach of its humblest citizens, yet in England, unfortunately, higher education until very recently has been almost an exclusive monopoly of the rich. The great Universities of Oxford and Cambridge, previous to the infusion of the modern spirit which followed the enactment of the measure for admitting Dissenters, were untrue to the very idea of a University, which, as the name implies, is an institution founded for the purpose of fostering the liberal arts irrespective of rank or creed. If Ingulphus is to be [illegible] Cambridge at least [illegible] a University [illegible] he tells us that in its earlier days thousands of enthusiasts in search of culture for its own sake flocked thither to hear the lectures of the learned men who initiated the University's academic renown. But afterwards both Cambridge and Oxford relapsed into wealthy denominationalism. They kept the treasury of knowledge closed to all but the affluent. And though it is true they have trained the majority of illustrious Englishmen whose names will live for ever in the history of literature, science, and politics, yet at the same time these ancient seats of learning must be accused of having fostered a vast amount of luxurious idleness. But fortunately an earnest effort is now apparently being made to adapt our English Universities to the requirements of the age. An educational revival has taken place of late years, and Oxford and Cambridge, more especially the latter, have already done something to satisfy its demands. The erection of colleges for the benefit of sons of the middle classes, and the inauguration of the system of Local Examinations, have, both directly and indirectly,

exerted a powerful influence in popularising higher education. But a still more important movement is that which has recently been started at Cambridge for the extension of the University system beyond the boundaries of Fen and quietude. In some of the large provincial towns, notably at Nottingham, the University Extension scheme has been adopted with marked success, and it has long been a matter of surprise to those interested in this important movement that London should have been behind-hand in welcoming the eminent Professors whom Cambridge is anxious to dispatch to organise classes in large towns, on the professorial method adopted in the Scotch Universities. It is true we have already in London admirable institutions, such as King's College and University College, where the facilities for culture are equal almost to those provided at the more venerable seats of learning at Cambridge; but when it is remembered that London has a population of three and a half millions, and that it is really not a single town, but a conglomeration of a number of large towns, it will be seen that our University accommodation, if we may use the expression, is totally inadequate to the popular requirements. It is satisfactory, therefore, to find that a society has been formed for promoting the adoption of the University Extension scheme in the metropolis, and yesterday a public meeting was held at the Mansion House in furtherance of the object which the society has in view. Amongst the speakers were Mr. Gladstone and Prince Leopold. Mr. Gladstone expressed the belief that if once the attention of the people of London were aroused to the importance of the proposed scheme, there would be no difficulty in procuring its adoption to an extent which would practically put the opportunity for acquiring the higher education in the way of every working man. One of the best lessons taught by University Professors of Mr. Ruskin's calibre is, as Prince Leopold remarked, that wisdom, which is, after all, the highest treasure, need not be costly or exclusive. "It is almost as cheap and as free as air."—*Daily Chronicle.*

APPOINTMENTS.

Appointments made by the Director of Public Instruction, between the 16th January and 15th February 1880.

T. V. Sreenivasa Iyer, B.A., 3rd Master, Government High School, Chittoor, to act as 4th Master, Salem College.

C. Kothandarama Naidu, 4th Master, High School, Chittoor, to act as 3rd Master, vice T. V. Sreenivasa Iyer, B.A.

V. Nadanmuni Mudaliar, 6th Master, Salem College, to act as 4th Master, High School, Chittoor.

S. Saminatha Iyer, 3rd Master, Government Middle School, Urubatur, to act as 6th Master, Salem College.

C. Cuppusawmy Iyer, to be Head Master, Government Middle School, Ongole, but to act as Deputy Inspector of Schools, Ongole Range, until further orders.

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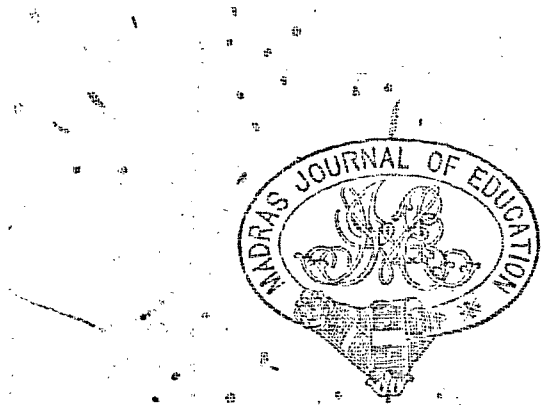

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MONTH.

We observe that some modifications have just been made in the Scheme for the Upper Primary Examination. The chief are the following:—

I. To the F or *History* course another alternative subject is added, *viz*:—

> The World's History (Macmillan's Indian Series) Chapters I—XXV, Freeman's Europe (Macmillan's History Primers) Chapters I—V, or a corresponding portion of any approved Historical Primer (40 marks.)
>
> *Translations of the "World's History" into all the South Indian Vernaculars will be published shortly by the Madras School Book and Vernacular Literature Society.*

II. To the G Branch or *Hygiene* Dr. Cunningham's Primer is added as one of the Text-books that may be studied for the Examination.

We are glad to see that the following paragraphs have been added to meet the cases of pupils deserving to pass, but who have been prevented by illness or other causes from attending the Examination. We think, however, that not only the Inspectors and the Deputy Inspectors but also the Headmasters of High Schools and Colleges should have the power of granting such certificates:—

> 12. In the event of a pupil being prevented by illness or other sufficient cause from attending the examination, the Inspector of Schools or Deputy Inspector may examine such pupil and give him or her a certificate declaring that the pupil has passed, and specifying the branches in which he or she has been examined.

13. Inspectors of Schools and Deputy Inspectors are authorized to give certificates of having passed the Upper Primary School Examination to such pupils as have in their periodical Examinations of Government or Private Schools come up to the standard prescribed. The branches in which each pupil has been examined shall be specified.

As the Senate of the University have decided that the teaching of Chemistry for Matriculation is to supersede that of Physical Geography after the end of this year, it will be well if School Managers order out at once a supply of chemical apparatus and chemicals sufficient for the experiments described in the first 73 pages of Roscoe's Primer of Chemistry in Macmillan's series, the book set for Examination. A list of necessary apparatus is given at the end of the volume, but this list would probably have to be slightly supplemented in Schools. The Primer will be found very elementary, and intelligent teachers will find any difficulty in teaching it, although they may have little or no previous knowledge of Chemistry. We observe that nothing whatever is said [illegible] Chemical Notation. Even the symbols for *Water* are not given. By the kindness of a subscriber we hope to be able very shortly to publish some practical hints as to the experimental teaching of Physics and Chemistry. From the very full report that we elsewhere give of the proceedings of the Meeting of the Senate, it will be seen that Physiology has been retained in the F.A. course, and Physical Science, in the B.A. course, Botany being omitted, but an alternative or B course comprising more of Natural and Physical Science has also been appointed.

We [illegible] that a Schoolmaster, Mr. K. C. Manavedan Raja, who took the 9th place in the B. A. Class list of 1878 and the 10th place in the First Arts list of 1875, and who is now the third Assistant in the Calicut Zamin Vidyasala, is made the first Hindu probationer for the Covenanted Civil Service under the new rules for the appointment of native Civil Servants. From all that we have heard of Mr. Manavedan's moral, intellectual and social qualifications, we believe that no better appointment could have been made.

The new Civilian was educated at the Presidency College, Madras. He is a member of one of the oldest families in Southern India, *viz.*, that of the Zamorin of Calicut, a family that has always been noted for its loyalty to the British re-

We have before us a very carefully printed edition* of Coleridge's Ancient Mariner with an Introduction, Notes and Glossary by Mr. C. M. Barrow, the Principal of the Kerala Vidyasala, Calicut. Mr. Barrow's scholarly Notes will be of the greatest service to all students of the Poem. Questions for Examination are appended. We understand that Notes on "Cicero" for the F. A. Examination of 1881 by the same annotator are nearly ready for publication.

Very full notes for F. A. students on Tennyson's *Aylmer's Field*, with Criticisms and Questions for Examination are also now ready.

University Scholarships.—In the report of the Syndicate of the Madras University just published it is stated that the Madhava Rau and other prizes founded in connection with it had been awarded to successful candidates. The Madhava Rau prizes were awarded to two pupils of the Combaconum College, as Sir Madhava intended them for students belonging to the Tanjore district. The Sri Goday Vari prize was awarded to P. Thanu Pillai who obtained the highest marks in Political Economy at the last M. A. Examination. The Arni Gold Medal, founded by the Jaghiredar of Arni in honor of the Prince of Wales's visit to Madras, was awarded to Kodandarama Aiyer, a student of the Madras Christian College, who obtained the greatest number of marks in Physical Science at the recent degree examination.

Expenses of the University.—The accounts of the Madras University passed at the meeting of the late Senate showed a balance of Rs. 1,220 in favor of that institution. The grant received from the Government for establishment amounted to Rs. 8,607-3-2; the fees from candidates applying to pass the different examinations were Rs. 53,570, of this sum the Matriculation candidates alone paid in Rs. 33,570; the F. A. candidates Rs. 11,940; the B. A. candidates Rs. 5,130, the salaries paid to the examiners amounted to Rs. 57,880; to the examiners of the Matriculation test Rs. 19,225; to the F. A. examiners Rs. 6,130; to the B. A. examiners Rs. 5,775; four thousand rupees were paid to the examiners for the M.A., B.L, and M.L., degrees. The University paid Rs. 850 for tabulation, and Rs. 4,838 on account of printing.

Railway Schools.—There will be two elementary schools for the children of the employés on the Madras line (one at Podanur having been established since October 1876), and it is intended to establish two others, one at Gooty and the other at Raichur. The school at Podanur until recently was aided by a grant-in-aid of Rs. 23 per mensem from the Local Funds Board, and with this and the school fees paid by the parents of the children the school was self-supporting, until in August 1879 and advance of Rs. 150 had to be made

* The Rime of the Ancient Mariner by S. T. Coleridge Edited with Introduction and a Glossary by C. M. Barrow, B.A., Oxon.—Addison & Co. Madras.

from the Sick and Allowance Fund towards the school funds, owing to the grant-in-aid having been stopped by the Local Funds Board. Subsequently, in February last, another advance of Rs. 100 was made from the Sick and Allowance Fund, and it was in respect of the total sum of Rs. 250 so advanced that at the last official meeting the Agent and Manager applied for sanction for that sum to be charged to the Company's revenue. The Agent proposes to apply for grants-in-aid for all schools, as they are opened; and expects that, with the grants-in-aid, the schools will be self-supporting; but if not he proposes that the loss be charged against the Company's revenue. As the most convenient mode of dealing with the matter Mr. Saunders suggests that the salaries of teachers, with other incidental charges, should be authorised in the half-yearly establishment lists, as a debit to Revenue, and that receipts from all sources should be credited to Revenue; the difference being shown half-yearly in the accounts as profit or loss, as the case may be. The Examiner of Railway Accounts is of opinion that Revenue should not be called on to make good the entire loss accruing from the schools. He suggests that Revenue might aid to the extent of teachers' salaries and menial establishment, but that any further expenditure should be defrayed from the Company's special funds. In urging on the guaranteed Companies the establishment of Railway schools, the Government of India appear to have contemplated the necessary cost being dealt with as part of the ordinary expenditure of the Company concerned; the building being erected from capital and the working charges debited to Revenue. On this principle the cost of school-house and teachers' quarters at Jalarpet has already been sanctioned as a charge against capital. The number of Railway schools likely to be established in this Presidency is small and the Consulting Engineer for Railways thinks the cost of working them may properly be dealt with as proposed by the Agent.

MIDDLE SCHOOL EXAMINATION.—In the Notification of the 17th October 1879, instituting the Middle School Examination, Tamil, Telugu, Malayalam, Canarese, Uriya, Hindustani, and Persian are recognized as second languages and tests are prescribed in each.

The Principals and Head Masters of several Colleges and Schools and other officers have expressed a wish that Latin and Sanskrit should be added to the list on the ground that pupils who are studying these languages are placed at a disadvantage and that the study of the classical languages will be discouraged by the omission of them.

Properly speaking, Latin and Sanskrit ought to be studied in addition to the Vernacular languages, and not instead of them. In Government schools the study of Sanskrit is not commenced until a pupil has reached the lower fourth class, and even when a pupil is learning Sanskrit he is still expected to go on doing translations from and into his Vernacular language. The fact of a pupil learning Sanskrit ought not, therefore, to materially interfere with his securing a large number of marks in the Vernacular in such an examination as the Middle School Examination, where three-fourths of the marks can be obtained for writing, spelling, composition, and grammar. In the case of East Indian boys the hardship is no doubt somewhat greater, but the scheme is so arranged that a boy need not necessarily take up any second language at all.

Nevertheless the Director of Public Instruction sees no great objection to Latin and Sanskrit being recognized as second languages. It is obvious, however, that the test must be of a much easier kind than it is for the other languages.

NOTIFICATION.—Latin and Sanskrit [illegible] be recognized as second languages for the Middle School Examination, and the test in each shall be as follows:—

Latin (120 *Marks*).

(*a.*) Grammar, as contained in the Public School Latin Primer or any similar book, to the end of Syntax. (60 marks.)

(*b.*) Text-book. Cæsar, De Bello Gallico, Book I, Chapters 1 to 29, or such book as may from time to time be prescribed. (30 marks.)

(*c.*) Translating easy sentences into Latin. (30 marks.)

Sanskrit (120 *Marks*).

(*a.*) Handwriting. Copying in a good clear hand a passage printed in the Devanâgari character. (20 marks.)

(*b.*) Orthography. Writing from dictation in the Devanâgari character. (20 marks.)

(*c.*) Grammar. The letters, Guna, Vriddhi, Visarga, &c. Declension of regular nouns. Conjugation of verbs of the 1st, 4th, 6th, and 10th classes in the present Indicative (commonly called Present *Lat*), Present Potential or Optative (commonly called Potential or Optative *vidhi lin*), Present Imperative (commonly called Imperative *Lat*) and Imperfect Indicative (commonly called Imperfect *Lan*). (40 marks.)

(*d.*) Text-book. Hitopadesa. Mitralabha from the commencement up to the 30th sloka inclusive, or such book as may from time to time be prescribed. (20 marks.)

(*e.*) Translating easy sentences into Sanskrit. (20 marks.)

AT a time when the abolition of the appointment of Director of Public Instruction at Madras is talked about, the experience of the Government of the North-West Provinces who have just revived the appointment for those Provinces and Oudh may be of value. The reduction of the appointment (which was reproduced in a less expensive form under the designation of Inspector-General of Schools) had been the result partly of immediate financial pressure, and partly of the avowed policy of the Government to restrict the expenditure on supervision in a way which, without in any degree impairing efficiency, would be more in keeping with the necessities of the case than the somewhat expensive establishment hitherto kept up. After some experience under the new system, however, the local Government came to the conclusion that the interests both of the department and of the public would best be served by the revival of the office; the more so as the amalgamation of Oudh with the North-Western Provinces had considerably widened the scope of the work and proportionally increased the responsibility of the chief officer. The Lieutenant-Governor accordingly revived the Directorship in the person of Mr. Griffith, late Principal of the Sanskrit College at

Benares, fixing for the future the pay of the appointment at Rs. 2,000. In other respects, the reduction that had been made in the strength of the graded service remained in full force, and the scheme of reduction as thus revised eventually received the assent of the Government of India.

The question of schools for indigent children of European and Eurasian extraction was again under the consideration of the Government. A system has for some time been in force in these provinces under which the school fees of such children are defrayed by the Government under the immediate supervision of the Magistrate of the district, quarterly returns being submitted to and reviewed by the Government. But this measure, a good one in itself, was not wide enough to cope with the growing evil; and at the close of the year under review, the general subject of schools for boys and girls, industrial training, and other connected matters was receiving the Lieutenant-Governor's careful attention. In the first instance inquiry was made as to the existing provision for the education of the children of railway employés, and measures were then taken to encourage, by prizes and scholarships on the one hand, and State inspection on the other, the railway schools which have already been established in these provinces.

The new system of middle class examinations (Anglo-vernacular and vernacular) which had recently been introduced, in connection both with the Educational Department proper and with the question of eligibility of candidates for admission into the public service (para. 13 of last year's Summary), underwent its first trial during the year under review. The results were on the whole very satisfactory; but comparison with those of past years is not possible, in view of the numerous changes introduced by the new rules.

The Princess Alice Scholarship.—Her Highness the Princess of Tanjore, Member of the Imperial Order of the Crown of India, having determined to institute a Scholarship in memory of Her Royal Highness the late Princess Alice, and to invest the sum of Rs. 1,000 in the name of the Accountant-General in pursuance of this object, has approved of the following Rules for the award of the Scholarship:—

I. The Scholarship shall be called "The Princess Alice Scholarship," and shall be tenable for three years.

II. The interest of the above sum of Rs. 1,000 shall be paid to the holder of the Scholarship.

III. The Scholarship shall be open to Hindu, Mahomedan, and Christian girls, and shall be awarded when a vacancy occurs to the girl who stands highest in the Special Upper Primary Examination.

IV. The holder of the Scholarship will be required to continue her studies for three years in any school under inspection in which provision is made for educating up to the Middle School Examination.

V. The Scholarship will be awarded by the Director of Public Instruction and may be suspended or withdrawn by the same officer for irregular attendance, negligence in study, or bad conduct.

His Grace the Governor in Council desires that the thanks of Government be conveyed to Her Highness the Princess of Tanjore

for her liberality in founding a Scholarship in honor of Her Royal Highness the late Princess Alice.

2. The draft rules for the Scholarship are approved.

3. The Accountant-General will arrange for the investment of the amount (Rs. 1,000).

Colleges.—In paragraph 64 of his Report on Public Instruction for 1875-76 Col. Macdonald pointed out the importance of every district being provided with an institution educating up to the First Arts Standard. Considerable progress has been made in this direction since that report was written. First Arts Classes have been formed in the Government institutions at Berhampore, Salem, and Cuddalore. The Maharajah of Vizianagram has raised his High School to the status of a College. The Hindoo Schools at Vizagapatam and Tinnevelly have become Colleges, and the Church Missionary Society is also raising its High School at Tinnevelly to a College. A few districts still remain, however, unprovided with any institution superior to a High School.

The Director has now the honor to recommend that a First Arts Class be formed in the Government High School at Madura. The population of Madura is, according to the census report, 51,987, and there are only two mofussil towns with a larger population than this. The Government High School is a large and flourishing institution, in which, according to the last Report on Public Instruction, the fees covered 6·17 per cent. of the expenditure. There are two other High Schools in the town. The Collector and the Inspector are both of opinion that the Government High School should be constituted a Second-grade College.

At first starting all that will be required will be one additional Master on Rs. 125 rising to Rs. 175 by biennial increments of Rs. 10. This is the rate sanctioned for the Salem College in G. O. No. 38, of the 1st February 1879.

It is proposed to meet this charge—

(a) by abolishing the Third-grade Middle School of Tiruvadamarudur,

(b) by abolishing a Master on Rs. 70 in the Madura High School,

(c) by increased receipts from school fees in the new College Department.

The question of abolishing the Government Middle School at Tiruvadamarudur has been under consideration for some years. The school is fairly officered and the Masters do their duty, but it seems impossible to secure anything like a proper attendance. The inhabitants prefer sending their children to the neighbouring town of Kumbakonam. The strength of the classes at the two last inspections is shown in the margin.

Classes.	October 1878.	Sept. 1879.
III	8	9
II	18	14
I	10	19
Total...	36	42

The school hardly deserves to be called a Middle School. Mr. Bickle-

and Mr. Marden have both recommended that the school shall be closed and the Collector is also in favor of the abolition of the school.

There are at present three divisions of the lower fourth class in the Government High School of Madura with an average attendance of sixty-two boys. Mr. Marden and the Head Master both observe that it is unnecessary to have three divisions of this class. A Master on Rs. 30 can therefore be abolished.

The saving effected by the reductions contemplated will be Rs. 111-13-0. It is probable that the school-fees in the College in the first year will amount to about Rs. 24 and in the second year to about Rs. 48. Eventually a larger sum may be expected. From the first, however, the increased expenditure will be met from the reductions of expenditure proposed and the increased receipts.

	Rs.	A.	P.
Average cost of a Third-grade Middle School ...	81	13	0
Salary of Master abolished in Govt. High School.. ..	30	0	0
Total ..	111	13	0

His Grace the Governor in Council sanctions the Director's proposal to constitute the Government High School at Madura a Second-grade College, the additional charge necessary for the purpose being met from the savings indicated and increased school-fees.

UNIVERSITY OF MADRAS.

THE Annual Meeting of the Senate was held in the Senate House on the 24th April for the following business :—

I. Consideration of the Syndicate's Report.

II. Election of the Faculties and their Presidents.

III. Election of the Syndicate.

IV. Proposal of Mr. Chisholm to put painted-glass in the windows of the Senate Room at a cost of rupees eight hundred each.

V. Consideration of the Report of the Physical Science Committee appointed by the Syndicate.

VI. Recommendation of the Syndicate to omit Latin as a subject for the Preliminary Scientific Examination.

The Chair having been taken by the new Vice-Chancellor, Sir CHARLES TURNER, Col. R. M. MACDONALD opened the proceedings by proposing that a vote be passed expressing the high appreciation by the Senate of the valuable services rendered to the University by the late Vice-Chancellor Mr. Justice Innes.

The HON'BLE V. RAMIENGAR, had much pleasure in seconding the proposition.

The VICE-CHANCELLOR, in putting the Resolution, only hoped that it might be in his power to afford to the University half the service his predecessor had given. The vote was then passed unanimously.

The Rev. G. M. RAE, then proposed the adoption of the Report of the Syndicate, and, in doing so, he would draw attention to one significant fact, that the University had now become self-supporting, as he observed from the statement of accounts that there was a balance of Rs. 1,200 in favour of the University. This was a matter for congratulation. He would, however, remark that it was not desirable that the University should become a source of profit; all receipts beyond the expenditure should be spent in scholarships or in some other way for the benefit of students. The tables in the report testified to the laborious and painstaking manner in which the Registrar discharged his duty, it might be said as a labour of love, and in a way that few other men would do it, with these remarks he would propose the adoption of the report.

The Hon'ble MIR HUMAYAN JAH BAHADUR seconded the proposition.

Mr. SINCLAIR would ask a question before the proposition was put to the vote. There had been some irregularity in making known the results of the last Matriculation Examination. It had come to his knowledge that the students of two Institutions had become aware of the results, and knew who had passed before the results were known to others. He wished to ask whether the Syndicate were aware of this; and, if so, what steps were proposed to prevent its recurrence.

Mr. COOK thought that, in the report, the *percentages* of passes should be tabulated. He also considered that it was not fair to the Schools to give, as the number registered from any School, all who chose to send in their names, but that only those recommended by the Head of a School should be so regarded, all others being classed as 'private students.' Another point he wished to draw attention to was the analysis of Results on page 10, in which failures were grouped, so many in two branches, so many in three, &c. He thought this would be much more valuable if those failing in each subject were given separately. In going into the lists for himself he had been struck by the great differences in the results; in Latin, for example, only 55 per cent. passed, while in English the percentage was 61; and against these was to be placed 87 per cent. passed on an average in the Vernacular Languages. Such percentages as these he thought would be of great value. He would also propose the insertion in the University Calendar of the Report of the Syndicate, and the separate publication, if need be, of the Examination papers. He thought also that the list of institutions affiliated should be given. The last remark he would make was on the Library of the University. He saw from the report that there was one, as volumes were mentioned as presented to it. Where was it? for whose use? and how was access to it to be obtained? There was no mention of it in the Calendar.

Mr. THOMPSON replied that the Syndicate had had under its consideration the question of the publication of the results and proposals were now before it for the instantaneous publication by affixing lists to the doors of the Senate house as soon as the results were known, when they would be open to all as the same moment.

Col. MACDONALD thought that the form of analysis proposed by Mr. Cook might be adopted, and that he [Mr. Cook] should address the Syndicate on the question. With respect to the number registered from a school, he thought the remedy was rather with the Masters of Schools than with the Syndicate. The correct principle was that all boys in the Matriculation class should go up for examination. If boys of the Matriculation class were unfit they should not be admitted into the class. It was within his knowledge that boys from the Fifth class of some schools sometimes went up, and some of these even passed, as it was the practice in some schools to have the Matriculation subjects read, in part, in the Fifth class, so that this really became a Matriculation class. The remedy for this was as he had said, in the Head Masters' own hands. He thought the list of affiliated schools should be given.

The VICE-CHANCELLOR then put to the vote that the Syndicate's report be adopted (Mr. Cook agreeing to submit his suggestions in writing to the Syndicate) and this was carried *nem. con.*

Col. MACDONALD next proposed and Mr. MILLER seconded the following additions to the different faculties :—

Arts. Messrs. Hanna, Grigg, Metcalfe, Wilson, Cornish, and Bashiam Iyengar.

Law. Mr. Bashiam Iyengar.

Engineering. Mr. Hanna.

Dr. CORNISH next proposed, and Col. MACDONALD seconded that the name of Dr. Bidie be added to the Faculty of Arts.

The voting for Presidents of the Faculties resulted in the following:—

Faculty of	Arts	Col. Macdonald.
„	Law	Sir C. Turner.
„	Medicine	Surgeon-Major Cornish.
„	Engineering.	Col. Shaw-Stewart.

The Syndicate was next elected, as follows :—

Five elected by the Faculty of *Arts.*	Col. Macdonald.	
	Mr. Thompson.	
	„ Miller.	
	„ Muttuswami Aiyar.	
	„ Grigg.	
One Law.	Mr. Justice Kernan.	
One Medicine.	Surgeon-Major Cornish.	
One Engineering.	Col. Shaw-Stewart.	

Mr. CHISHOLM's proposition was next to come up, but a letter from that gentleman withdrawing it was read.

Mr. THOMPSON then said he had been requested by Dr. Furnell who was not well enough to attend, to propose the Resolution that Latin should be omitted as a subject for the Preliminary Scientific Examination. He regretted that Dr. Furnell was not present to do justice to the subject. It was, however, a simple matter, just amounting to this, that many Natives would take up Medicine but for having to pass in Latin as a preliminary. And the knowledge required was of the standard of the First Arts Examination, and thus considerable, requiring much time for the study, and it was not possible for natives to give this time with the other claims on them, he therefore thought it a hardship that should be removed.

Mr. MILLER would second the proposition, as he thought the change would involve no appreciable loss ; and, even were the loss *appreciable*, the change would, in his opinion, still be a desirable one, since the bar which the retention of Latin presented was insuperable to natives. As long as it was maintained, very few native students would come forward for the Medical degree. They should therefore be even prepared to *lose* something in order to gain native students of Medicine ; but, he contended, the loss would be very small, while the gain would be great.

Dr. BIDIE thought the standard in Latin was too high, he would therefore lower it, but not do away with it. The Medical man ought to have some knowledge of it, so as to be able at least to read three chapters of *Celsus*, and write prescriptions.

Dr. CORNISH agreed with what had been said by Mr. Thompson and Mr. Miller, and thought that no obstacle should be left in the way of native students of Medicine, he was therefore opposed to Dr. Bidie's amendment.

The VICE-CHANCELLOR said that the Latin test was necessary in England as a guarantee of general education, but here it was not so, as students must have passed the F. A. Examination, which is a sufficient guarantee. As to the writing of prescriptions, it might be better if they were written in English (*a laugh*) ; and knowing the Latin names of drugs was a different thing from knowing Latin, and would be an easy matter.

Dr. Bidie's proposition found no seconder and was not therefore put. The proposition to do away with Latin was then put to the vote and carried.

The consideration of the Report of the Physical Science Committee was next proceeded with.

Mr. RAE, would wish to see the Minute of the Syndicate appointing the Committee, and to ask if any letter was written.

The REGISTRAR could state what took place. Mr. Cook had written to the Syndicate asking that the matter might be considered, and Dr. Wilson had done the same; and it was on these letters that the Committee was appointed.

Mr. WARLOW would ask if no Record was kept of such proceedings.

The REGISTRAR said 'yes;' and the Record was afterwards produced, meanwhile Mr. Rae accepted the reply, and the business proceeded.

Mr. COOK, in proposing the adoption of the Report of the Science Committee, said it was unnecessary to read it as it was in the hands of the Members of the Senate, and, that he would simply supplement it as a whole with a few remarks. He spoke as follows :—

"1*st. As to Matriculation.*—The Science subjects at present read are Balfour Stewart's Physics Primer (to end of *Heat*), and Geikie's Physical Geography Primer (the whole). The latter book presupposes a knowledge of Physics and Chemistry to begin with,—such as none of our pupils have—and it is consequently not surprising that the difficulty of teaching is so great, and that the *results* have been, as I think is acknowledged, far from satisfactory.

In the science series to which these belong the Physical Geography Primer comes, in point of study, after the Chemistry and Physics; and this is of course the logical order. For Physical Geography is an *applied science*, with broad generalizations, based on the laws of Physics and Chemistry. Though to older heads it is a most interesting and comparatively easy subject, (in a general way) it is not likely to prove such to our youthful would-be matriculates. We were unanimous then in recommending that the logical and natural order of approaching science should be adopted in this University, and that the subjects *Physics* and *Chemistry*, which go hand in hand in leading on to all modern science, should be linked together at the very outset in our University curriculum.

The practical difficulties, in connexion with the *teaching* of the subject, may seem at first sight to be great. But if any one with only a knowledge of Physics even such as the Elementary Primer gives, will look carefully into the Chemistry Primer recommended he will find that (1) the Experiments to be performed by the teacher are all of an exceedingly simple character and such as any one with a *little* preparation and with *hands at all* may be able to show, even though he has had no technical training in Chemistry; and that (2) the cost of the apparatus, of which a complete list is given at the end of the book, is trifling, and it may be had in any quantity at very short notice from a hundred scientific instrument shops in England. A single Box will contain all that is required of new apparatus, *i. e.* in addition to what is required for the practical teaching of the Physics Primer.

The linking of Chemistry and Physics will *compel* the practical or experimental teaching of both subjects—which it is clear enough from the answers given to the Physics paper last year is utterly unknown in many places at present. As regards Physics, for instance, I do not think I exaggerate when I say that more than 500 examinees told me that mercury when heated from 0° C to 100 °C would *melt* showing they had never set eyes on mercury in their life. Now I hold that such a non-experimental teaching of these subjects

(with the substitution of little arithmetical problems for experiments) is very much the same as if a medical man were to be trained in the study of anatomy by nothing but diagrams. We were all agreed further in recommending that the *principles* of the subjects Physics and Chemistry should be tested, and not *arithmetical applications* of these; for it is well known that these can often be solved when no clear explanation of the principle involved could be stated by the pupil.

II. *First Arts.*

In this, if we exclude mathematics, the only scientific subject at present is *Physiology* as in Huxley (Chaps. I—VII).

The difficulties in the way of teaching this are exceedingly great at present. Our students know no Chemistry—may not know the difference between *Oxygen* and *Hydrogen*: and as there are constant chemical references in the underlying principles of Physiology, it is utterly impossible to get the students to understand these without a preliminary course of *Chemistry*. The mere anatomical portions of the subject can be demonstrated by models, diagrams, &c., and they may attain a very fair knowledge of these. But this is but a fraction, and the smallest fraction, of the subject.

I observe that the Syndicate would approve of the retention of the study of the subject Physiology "in a more complete form and with an easier text-book." So far as the portion read (Chaps. I—VII) goes, I do not think Huxley's book could be surpassed. Every line is linked with every other with the greatest logical clearness and the utmost regard to scientific accuracy, and to prescribe a book without this, written in a more loose and apparently simpler way would be simply a retrograde step. The Syndicate has not ventured to name the book and if it be not yet published, we may at least wait for its publication ere we propose its substitution for Huxley.

Another grave objection to the introduction of Physiology in the F. A. is that it is a new scientific departure altogether, rendering the science course *jerky*. It does not link the Matriculation and the B. A. course in one connected chain.

It may be said that the teaching of the Chemistry in the Matriculation would obviate the first objection. This is true to some extent I admit. But I shall now proceed to show that the subject excluded from the Matriculation may be taken up in the F. A. and that Physiology finds its place and its proper place among the B. A. subjects, and that by the *substitution* of the Physiography for the Physiology we should have an immense improvement.

Huxley's Physiography is a most comprehensive book, written in his masterly style, incomparable for logical clearness. It would be, if anything, on the whole easier than the Physiology. It embraces all that would be omitted by excluding the Physical Geography from the Physics and a great deal more; and it is so comprehensive that it points to almost all of the great scientific groups of subjects prescribed for the B.A. Its references to Physics, and Chemistry are such that it would be closely bound to the study of these in the Matriculation class, and thus act reflexively in increasing the value of these. After an introduction on the general principles of Cartography, it discusses Springs and Strata suitable for the existence of such mineral springs, and some elementary geological principles connected with strata and soils; Artesian wells; Rain and Dew; the Classifi-

cation of Clouds; Rainfall, and Hyetographical Maps representin such for large areas; Hygrom ry; Crystallisation of Water, Sno and Ice; Rock crystal and cry alline forms; Evaporation; Atmo metry or measurement of atm spheric moisture; Distillation; th Atmosphere, its chemical constitution, the chief properties of th elements composing it; functions of Carbonic Acid; Specific gravity presence of impurities in air such as Ammonia, Sulphuretted Oxygen Nitric acid, Organic germs; difference between vapours and stable gases; Barometers and barometric charts—Meteorology as far as dependent on the barometer; chemical composition of pure water and some Elementary chemical facts; Analysis of water; Chemical composition of natural waters; Salts of Sodium, &c., found in natural waters; the work of rain and rivers, of ice, of the sea, of earthquakes, and volcanoes: the distribution of land and water the figure and movements of the earth, &c. In fact we have almost an extension of the matriculation science subjects to a more advanced standard, with the practical bearings, of the principles on the facts of everyday life and experience.

Now though change is not in itself desirable in a University curriculum, still if the advantages I have pointed out are recognised by the Senate, I should consider that when we are about making a few changes another will be less harassing than it would otherwise be.

III. *B. A. Examination.*

As in our science Committee, so in the Senate I dare say, the chief difficulty will be in connexion with the B. A. degree Examination. There can be no doubt that in the course as it stands at present science is at a great disadvantage in comparison with the other optional subjects especially *Logic* and *Morals*; and there can be little doubt I think that this is the simple reason for the popularity of the latter. The students will of course choose the subject in which with the least work, they are likely to secure best marks and the best chance of passing. This is supported by the fact that a change in the style of Examination papers set last year has produced an increased number of students in the Junior B. A. classes for this year that have taken up Physical science as their optional.

Well, our Committee had a good many meetings on the subject of the B. A. science. At first it did not look as if we were at all likely to come to anything like unanimity on the point. For my own part I was at first strongly inclined to simply cutting out *Botany* from the list of Physical science subjects so as to make the optional subjects more *quantitative*, leaving the present B. A. as it is and adding a B. A. *B course*, with a purely science side for those who might care to take it up. On this point our Committee was about equally divided, and we seemed likely to come to a dead lock.

It was then suggested that we should write to Calcutta and inquire of the University Registrar there the results of their experience as to a B. A. course with a division A from which physical science was excluded, only *Mixed Mathematics* being left as a compulsory subject. Mr. Evans did so, and from the answer received from the Registrar, we found that the Calcutta B. A. (*B*) course has increased in popularity year by year. The Registrar of the Calcutta University also remarked that it was all the *best students* that took up the B course.

The following are the statistics taken from the Reports of the Calcutta University Syndicate for the past few years :—

Year.	Appeared.		Passed.		Percentage passed.		Total appeared.	Total passed.
	A.	B.	A.	B.	A.	B.		
1874 ...	138	79	46	44	33	55½	217—2	90=42%
1875 ...	150	131	43	30	29	22½	281—4	73=26%
1876 ...	135	154	70	74	52½	48	287—5	144=50%
1877 ...	90	138	27	41	30	30	228—5	68=29%
1878 ...	132	191	29	62	22	33	323—8	91=28%

My opposition to the removal of the Physical subjects from the *A course* was now withdrawn in the face of this experimental evidence, as was also that of Mr. Winter. With the exception of Mr. Smith we were consequently unanimous in recommending the institution of the B. A. degree here on a similar footing to that of Calcutta. Theoretically Mr. Winter, and myself were still inclined to the opinion that the leaving of science in the *A course* should not damage its position or popularity, as the real science students, who would adopt the study from natural inclination, would be likely to take the *B course* to get all of it they could, while those who, though not eager for the study of it, might still wish to know something of it, might be allowed to have that desire satisfied without committing themselves wholly to it, and those who had positively no taste or liking for Science might get their B. A. without taking either *Mathematics* or *Science*. The other Members of Committee, who are here to explain their own view, thought that this would be simply to render the *B course* a farce as nobody would be likely to take it up.——Of course there is another aspect of the case——is it desirable that a student should be encouraged to take up a smattering of science for his B. A. degree as is done at present? Is the ultimate result not detrimental instead of helpful to science in the long run? Should a student's knowledge of science not be as complete as possible? It should of course, but it may be said such a knowledge would be best insured by the institution of a purely science degree. This the Committee had also under review. We know a B.Sc. has been recently instituted in Bombay, but it is a question whether we are yet ripe for it, or whether there is the demand for it in this part of India. Also I believe the scheme of the B. A. degree Examination in Bombay has been recently recast, and if it be on the lines of the Calcutta University, then we should only be rendering the course similar in all the three Indian Universities—a most desirable thing, surely.

IV. M. A. degree.

With regard to our proposal for the M. A. degree, I shall only briefly remark that we recommend that Jevons's Principles of Science

should be read by any candidate who may wish to take his M. A. degree in Science. Any one who knows anything of the book at all knows that the mathematical and science references constitute by far the larger portion of the book. With this recommendation, we have done little else to the M. A. degree than adjust the groups of science subjects so as to be more co-ordinate."

Mr. EVANS seconded the adoption of the Science Committee's report, remarking that all the members who had had a scientific training were in favor of the recommendations, and he thought those who had not could not form an opinion.

Mr. MULLEN wished to enquire what the term *Mixed Mathematics* in the B course exactly meant as used in the report of the Science Committee, and it was replied that *pure* mathematics were excluded.

The VICE-CHANCELLOR thought it would be desirable to take the report in three parts, placing those relating to the Matriculation, the F. A. and the B. A. separately before the Senate. Was it therefore the pleasure of the Senate that the Committee's recommendation regarding the Matriculation examination be adopted?

This was then carried.

The recommendation regarding the F. A. namely that Physiography should be substituted for Physiology was next put.

Mr. RUNGACHARLU (of Mysore) would remark that the subject of Physiology was a good and valuable one, and should not, he thought, be omitted from the F. A. course. Physiography was, no doubt, of value, but it should not supersede Physiology.

Mr. WARLOW would remark that he thought Mr. Evans had not put the question fairly, for those who may have had no scientific training are yet able to judge of the suitability of a subject. He was himself an old examiner and claimed the right to form his own opinion on the question of the selection of subjects. Mr. Evans had said that the opinions of those who had studied a subject should be allowed to prevail but a distinction was necessary. Persons who might not be qualified to say which were the best text-book on a subject were, yet, *not* unqualified to judge of the fitness of *a subject* to be placed in the curriculum of studies. He considered the subject of Physiology preferable to Physiography, he would therefore retain the former.

Surgeon-General CORNISH would second Mr. Warlow's proposition. The advocates of the change had laid great stress on the statement that those who opposed the retention of Physiology were not experts. He had looked through the list of the Committee that proposed the removal of the subject and he had not found one *physiologist* among them (*much laughter*).

The HON'BLE. V. RAMIENGAR thought he expressed the wishes of the Native Members of the Senate, when he advocated the retaining of Physiology.

Dr. WILSON contended that it was *impossible* to give a knowledge of Physiology to the students for the First Arts examination. In support of which view he quoted Professor Huxley's requirements for a student of Physiology.

Col. MACDONALD, after giving a sketch of the history of the original introduction of the subject of Physiology into the University curriculum, thought that before the Senate changed the scheme of study it should have before it good reasons for doing so. The

report of the Committee, he contended, did not explain on what grounds the subject of Physiography should supersede Physiology. As to the impossibility of teaching the subject, students of the same standing in the London University took up the subject, it therefore evidently could be taught. Lower still it was a subject of examination in the Oxford Local Examinations; and even lower than this it was recognized in the schools examined in England for results grants. In the Medical College the teaching of the subject was larger. It was therefore clear that students below the standard of our Matriculation class did Physiology. Medical subordinates also read it, it was therefore evident that the teaching of the subject could not be the impossibility represented. The objection reminded him of the qualifications for a poet demanded in Rasselas after hearing which the sage declared that "No one could be a poet."

As regards the text-book, he had a letter from Dr. Brockmann, the examiner in the subject, in which he expressed his opinion that *Huxley* is ill-suited. He (Col. M.) thought that it would be inexpedient to discontinue the study of Physiology, not only because of the reasons already given, but also on account of the expense that had been incurred in the provision of diagrams, models, &c. Moreover the style of teaching of the subject was improving (the speaker here read an extract from Professor Huxley stating that he Professor Huxley also found the papers in Physiology creditable) and he contended that as the subject had been efficiently taught even in Primary Schools in England the preliminary knowledge insisted on by Dr. Wilson could not be necessary and the subject could be taught here. There was to be considered, moreover, the practical value of a knowledge of Physiology. To meet the views of the Committee he would propose to retain the subject of Physiology, but also to add to the course Physiography, substituting however for Huxley's Physiology, *Foster's*.

Mr. MUTHUSWAMI AIYAR would second Col. Macdonald's proposition. In speaking to University graduates he had found them in favor of Physiology. He had, however, no objections to Physiography, but he thought that Physiology should not be excluded.

The VICE-CHANCELLOR remarked that when he was at Oxford they read the Fourth book of the Ethics but they certainly learnt nothing of Philosophy from it. So it might be asked what had been the result to our students of the study of Physiology. "A little knowledge" was proverbially a dangerous thing and this was certainly the case with Physiology. On the whole he thought Col. Macdonald's proposition, to retain the subject with an easier text-book and to add Physiography, the best.

Mr. MULLEN was unable to agree to Col. Macdonald's proposal. The compromise he proposed afforded, no doubt, an easy way out of the difficulty, but he did not think it was one the Senate should adopt. He thought, too, the tone of the Science Committee unsatisfactory, and he could not at all concede that the determination of the fitness of subjects of study was not a matter on which others than experts had a right to an opinion. On the contrary, it was a matter that the whole Senate were bound to consider. To the addition of another subject to the curriculum, as now proposed there were many objections. It was always to be remembered that extension of breadth

meant loss of depth; the more is done, the less thoroughly will it be done. As therefore it was impossible to do everything, a selection must be made. A University should develop character and mind, and this is to be done by the study of a few subjects well, and not by the study of many superficially; they should not therefore bring in the additional subject of Physiography. It was true that students could and would *get it up* if it were laid down, but just getting up a subject for examination, and profiting by the study of it were two very different things. The more subjects students were forced to bring up, the less *study* would there be and the more *cram*. He would therefore make a choice. The Committee wanted a complete symmetrical course, but they must look to practical work, and not to symmetry and elegance. If there were a clear field of choice before them then he might be inclined to choose Physiography, but Physiology is already in the course, and the study of it has done good, and they should not, he thought, displace it without strong reasons. It took a long time to get a subject well taught, and Physiology had now the advantage of having been taught for several years, and its teaching had begun to bear good fruit. He was therefore clear against both the change proposed by the Committee, and the addition advocated by Col. Macdonald.

Dr. OPPERT thought that if the Committee were unanimous their recommendation should be adopted. The Syndicate had appointed the Committee, and their opinion should be accepted. He thought that because Physiology had hitherto been taught was no sufficient reason for retaining it.

Mr. KRISHNAMA CHARI thought they should have either Physiology or Physiography, and of the two he was in favor of the former.

Mr. THOMPSON thought the question was, were they to follow blindly the Committee, or were they not? Carlyle had said the world contained so many million people *mostly fools*. Still, fools, have opinions. Must the Senate defer entirely to the opinions of the Committee? Col. Macdonald had shown that Physiology is useful and important. The question was not one between the Committee and the Senate, but one of general opinion. He had the greatest respect for the Committee, but must still judge for himself. Col. Macdonald's proposition would bring in too heavy a burden. He had read the Physiography, and knew that the getting up of the book would be a ready task, and it would be impossible to prescribe more than a part, he would therefore take Physiology alone, and the first question to decide was whether they should take Physiology or Physiography.

Mr. RAE was in favor of retaining Physiology. He contended that others than experts had a right to speak on the question; those engaged in teaching, for instance, know students and can judge of the adaptation of means to ends. There were strong objections to constant changes in the subjects of study, and he thought there had been too much of tinkering already. In favor of Physiology there was its relation to the B. A. course, when the study of Psychology came in, and Psychology was intimately associated with Physiology, so that students who took up Psychology for their B. A. course should have some knowledge of Physiology, this subject should therefore be retained in the F. A. course. Objection had been taken to Huxley as a Text-book, but teachers approved of that book, and

it would be a pity to change it, as it was adopted, and fitted in with what comes after, just taking the student on to the point where he would take up the subject in the B. A. course. On the whole he would make no change, and would support Mr. Warlow's proposition.

Mr. COOK said the Committee did not impugn the value of Physiology, but boys passed in it with superficial knowledge, and that if the argument of the Director of Public Instruction proved anything at all, it was that the Physiology should be introduced into the Matriculation examination. Then as to the new text-book proposed, Foster was not at all suitable, it was in fact, Huxley boiled down.

The VICE-CHANCELLOR then put Col. Macdonald's proposition to the vote, and it was lost by 15 to 5.

The original motion to substitute Physiography for Physiology was then put, and lost by an overwhelming majority [17 to 3 we believe.]

[The VICE-CHANCELLOR then proposed the adjournment of the meeting to 5 P.M., on the 1st May which was agreed to.]

The adjourned Meeting took place as arranged.

The VICE-CHANCELLOR opened the proceedings by proposing that Mr. Cook should introduce the subject for consideration.

Dr. WILSON wished first to be allowed to refer to a matter connected with the last meeting, namely, the allotment of extra marks to the subject of Physiology in the F. A. Examination. It was the only scientific subject in that Examination, and the marks for it were only one-eleventh of the Maximum for the whole examination. He hoped the decision of the last meeting as to the retention of Physiology would before long be reversed; still, as long as the subject was recognized, it ought to have additional marks, otherwise it would be neglected by students who could secure enough marks to pass in English and Mathematics. He would therefore propose that the Maximum be raised from 50 marks to 70.

Mr. EVANS would second the proposition.

Mr. STEVENSON wished to enquire whether the proposition was meant to affect the grand total, and so raise it from 540 to 560. Perhaps some one would be able to explain to the Senate why the number 50 was originally fixed. There were probably good reasons, and it would be well that the Senate should have these before them; also he 'thought some more substantial reasons than those advanced were required to recommend the proposed change.' Fifty was probably laid down advisedly, and should not be changed without sufficient reason.

Mr. THOMPSON said the way in which 50 marks were fixed as the Maximum was this. Physiology had been introduced as a new subject in the place of Geography, and so the 50 marks for Geography were transferred to Physiology. The arrangement was convenient, and there had been no other reason.

Col. MACDONALD was in favor of raising the maximum to 70. Mr. Thompson had explained that 50 had been fixed on by accident, and he considered that the higher number better represented the importance of the subject.

Mr. KRISTNAMACHARI would not only increase the number of marks, but also lay down a Minimum for passing.

Mr. STEVENSON after Mr. Thompson's explanation saw no objection to the proposed change.

The VICE-CHANCELLOR then put to the vote the proposition to raise

the marks for Physiology from 50 to 70 and the grand total from 540 to 560. Carried *nem. con.*

Mr. COOK then introduced the following proposition :—

"That an optional (B) course for the B.A. Degree shall be instituted, "so that a candidate may elect to be examined in the present course "(A) as it now stands in the Calendar. Physical Science being "omitted from the list of optional subjects ; or in a new course (B)."

(See page 125.)

In support of the proposition he spoke as follows :—

The origin of the appointment of the Science Committee whose proposal with regard to the B.A. Examination I rise to move was a conviction on the part of some of us, whose sympathies lean towards Science, that in the present B. A. course of the University the scientific subjects are not on a fair footing as compared with other subjects, or at least with *Logic* and *Morals* ; and that this is the simple explanation of the popularity of the latter and of the small hold Science has as yet taken on the Education of this Presidency. We need not wonder, and we cannot blame the students that they select the subject in which they are likely to pass with the smallest amount of labour expended, or find which they are likely to score the best marks : and the increased number that have taken up Science for the B. A. this year is easily traceable to the improved style of papers set at the last Examination in Science, and perhaps also to the style of papers set in Morals. The Principal of the Presidency College made the same remark in his Annual Report this year.

As I explained in my general remarks on the Committee's Report, one half of our Committee at first thought that the cutting out of *Botany* from the list of *Physical Science* subjects, would reduce that branch to something like equality with the other optional branches, and so render Physical Science more attractive to the students : and that the institution at the same time of a B. A. *B course*, of a character *chiefly scientific* would give science that additional scope and *encouragement*, which we consider it is for the future good in every way of this Presidency that it should receive.

Our difficulty was about the very point which the Syndicate suggests should be modified. Mr. Evans communicated with the Registrar of the Calcutta University anent their experience of the bifurcated B. A. course ; and received in reply statistics which prove that the science side has been yearly gaining in popularity ; the tide of popularity not being stemmed even by the percentage of passes in the B course being less than for the A course. The Registrar also said that it was all the best students who took up the B side.

We were now unanimous, Mr. Smith alone dissenting, after receipt of this testimony from Calcutta, that we should recommend the institution of a bifurcated scheme in Madras on the lines of the Calcutta scheme. We considered that our previous objections as to the removal of Physical Science altogether from the list of optionals in the A course, which were of necessity purely *theoretical* or *hypothetical*, must be withdrawn in the face of this *experimental* evidence from Calcutta.

Mr. Smith objected, and his objections are printed as an appendix to the Report (i) that we could not call this a B. A. degree (ii) that it would be more suitable for a B.Sc. degree ; (iii) that the Calcutta F. A. Examination covers some of the ground (in mixed mathematics) to be taken up in continuation for the B. A. degree ; and (iv) that the compulsory addition of pure and mixed mathematics to Physical Science would have a discouraging effect on the Study of Physical Science.

As to the first objection it appears to me enough to reply that, as we are at present, the B. A. degree means something different for almost each

different University and that exactly the same objections would apply to the bestowal of the name M. A. degree. The whole tendency of modern views on education is in opposition to the old fashioned idea that a B. A. or M. A. degree should have a meaning stereotyped for all, and is in the direction of their being simply a seal or stamp that the holder has attained a certain degree of culture in one or more of the many fields of human intellectual labour.

As to the second that it would be really a B.Sc. degree and that it would be as well to call it so, I reply that a B.Sc. degree surely means something very different in standard and does not admit of the same amount of option as we give among the different groups of science subjects. If we take the B.Sc. of London University it includes a vast deal more. That such a degree will be instituted in course of time there can be no doubt ; it is for the Syndicate and Senate to discuss that as a separate question, such might be instituted in addition to the B. A. (B course). No doubt the B. A. B course would have its *supplement* in the B.Sc degree, but the institution of the B.Sc. would not necessarily mean the abolition of this B. A. B scheme. At all events we have the *consensus* of the other Universities of India on our side in regard to the view we take.

As to the 3rd objection that the Calcutta F. A. covers a portion of the ground assigned to our B A. B course, that is irrelevant as an objection to the whole proposal : it is really equivalent to saying we prescribe *too much* under the head of *mixed mathematics*. Now all that we prescribe in addition to the F. A. pure mathematics, is *Geometrical Conic Sections* ; and in mixed mathematics, *Statics* and *Dynamics* (without the application of the Differential and Integral Calculus) *Hydrostatics* and *Pneumatics* and *Optics* (Geometrical.) Now all this ground is covered in our Scotch Universities in a course of *five months*, with a daily lecture of one hour, and to say that that is too much to prescribe for our Indian Colleges for a two years' course is certainly either charging Indian youths with [illegible] than they usually get credit for in engaging [illegible] Professors.

As to the 4th objection that Physical Science should not be linked with pure and mixed mathematics it amounts simply to this, our Colleges ought to develop a taste for the study of the Physical Sciences merely in *popular* fashion, but not in the way in which they are taught by all the great exponents of Physical Science and in all the great centres of Physical Teaching. I say it is well to *introduce* the study of Physics to our *matriculates* in its most attractive garb, stripped of dry mathematical clothing ; but it is simply asserting in the teeth of the past History of the Physical sciences to say that any proper study of them can be taken up, or that they can be mastered in any satisfactory fashion, if divorced from their concomitant mathematics. Just look at all the greatest expositors and advancers of Physical Science. Thompson, Tait, Maxwell, Helmholtz, Wüllner, and a hundred others—they are one and all mathematicians, and mathematics has been their right hand in their great Physical work. Why even in the theory of modern Chemistry, mathematics is getting a larger and larger share every year. What sort of a Physicist would he be, who, when any problem involving a knowledge of the elements of Statics or Dynamics presented itself, could not tackle it ? Such problems are constantly occurring even to the purely experimental worker in Physics, and he would be a mere smatterer, a mere amateur, in these if he know nothing of mixed mathematics ; and to exclude mathematics would be for the University to *insure* that its students should turn out nothing but smatterers in science. To propose such a study of science in our University that we might prescribe CHAMBER'S *Information for the People* as our text-books would only be to bring our University into deserved contempt.

Now we do not mean to assert that the scheme we propose is any great discovery, or to claim any great credit to ourselves for its proposal. We only claim that the scheme is a better one for science than the old one; and that it is a fair and a workable one, and we are backed up by the other Universities of India. And we mean to assert that our own knowledge of science is sufficient at all events to shape this course, though not one of us may be a Maxwell, or a Helmholtz. My own wish, and I think, that of the whole Committee has been simply to give science a fair chance in *this* University, and such a position as is now assigned to it in almost all the Universities of the civilized world. Now the bone of contention here will be, I dare say, that the cutting out of science from the A course is *unnecessary*, and will to some extent prevent the diffusion of scientific study. I have already said such was our own idea when we first approached the subject, but that we came to see it in a different light and that no amount of theory or hypothesis or probability is to be put for a moment against the evidence of actual experience—such as they have had in Calcutta. There can be no difference of opinion I think that the cause of science will be best promoted by ensuring that our students shall leave the University with some *substantial* knowledge of it. The whole future life of India will be shaped by its Universities, and the ideas of its millions will be moulded to a great extent by the study of Science: if this study is to be but a smattering of Science it were better omitted altogether; the result will but be to turn Science into ridicule. For such a smattering is not inconsistent with the retention on the part of the Hindus of many of the old notions which every friend of India must wish to see swept away.

Mr. EVANS briefly seconded the proposition.

Mr. MILLER brought forward the modification which was approved by the Syndicate, namely,—"That the present B.A. course remain as it is except that Botany be struck out; and that the proposed B course be accepted as an alternative B.A. course."

Thanks were due to the Science Committee, but the course proposed by it needed modification, and though he would regret if the Committee felt disappointed, yet he thought the Committee itself was not free from fault. It had been asked to *reform* the scheme of Physical Science, but instead of a *reform* they had proposed a *revolution*. He hoped, however, that the Senate was not prepared to adopt so sweeping and radical a change. Hitherto this University had adopted the principle of encouraging a liberal culture. It was now, in effect proposed to do away with this breadth, and to substitute for it intensity and narrowness; for this proposal would *compel* the neglect of other subjects. They had to consider what the effect would be (1) on the course of study; (2) on the students. The first effect would be that students would be forced to have either no science at all, or nothing but science. The present scheme laid a fairly broad foundation of liberal education, including Logic, History, Mental and Moral Philosophy. After getting some knowledge of these a student might confine his study to one subject, but *not till then*. But according to the proposed scheme, a student had to take up nothing beyond mathematics except physical science—no history—no philosophy. The University should not stamp such men as B.A's. There was also the consideration that the B.A. was preparatory to the B.L. Degree. Are men to become Bachelors of Law with no knowledge of History, none of Mental Science. In his remarks at a meeting where he had presided, the Vice-Chancellor had referred to the value to lawyers that a knowledge of Physical Science would be.

The proposition before the Senate would make it impossible that graduates in Law should know anything of Physical Science, unless they entirely neglected History and Mental Science, subjects which for a lawyer are simply essential. Such an alternative was he contended, an entire mistake. The Sciences and the facts of the material creation were not the only things worth knowing; and the practical effect of the scheme the Senate was now asked to adopt would be to form two hostile camps, one including those who were content to know nothing of Mathematics or Science, the other of those knowing nothing of History or of the Science of Mind. It had been said that the scheme proposed had been adopted in Calcutta. That University judged for itself. This University should judge for itself. But, as a matter of fact, Calcutta had *not* made the mistake. The scheme there was broader, and included History, Mathematics, Logic, and Psychology. Students who take up the B course in Calcutta know History and Philosophy. They must look at the course as a whole. Look also at the effect on students. The proposed scheme so far from promoting would, practically be a bill for the suppression of the study of Physical Science, and would thus defeat the object of its advocates. He thought Physical Science should have fair play. At present it is making its way satisfactorily. In his own College, the first year, 10 students took up Physical Science, now there were 40 studying the subject. Under this new scheme, in place of 40, there would be 5 or 6 at the utmost. Personally, he would not greatly regret this result; but he had no doubt that it would follow on the compulsory study of so much Mathematics as the Committee wished to load Physical Science with. Had they proposed a little Mathematics he would have agreed, but instead of a little, students selecting Physical Science, would be compelled to take up also *all* the Mathematics except Astronomy that are now taken up as a specialty, the necessary consequence of which would be that the number taking up Physical Science would be immensely reduced. The Committee say this has not been the result at Calcutta, but the cases are not parallel. In Calcutta the study of Mathematics is compulsory on all: here a student need not take up Mathematics. Only four years ago the Senate of this University decided that Mathematics should not be imperative for the B.A. degree. That arrangement had now been in force for only two years, and were they so soon to make another change? If the change proposed were made, the result would be the reduction of the number of the students taking up Physical Science, and the Senate would have either to revert to the present scheme, or follow Calcutta and make Mathematics compulsory on all.

On these various considerations the Syndicate proposed the compromise he had brought forward. Physical Science they proposed to retain in the A course, but to strike out one of the four branches it had hitherto included. For omission they had selected Botany. They further proposed that the new B course should be accepted as an alternative B. A. course, so as to give this latter full scope. If students who take up Physical Science still select the A course, that will prove the B course to be ill-adapted.

Mr. RUNGANADA SASTRI briefly seconded the Syndicate's proposals, he did not see the necessity for adding Mathematics to Physical

Science, as enough of Mathematics was included in the F. A. course.

Mr. RUNGACHARLU, while approving generally of the Science-Committee's scheme, thought the omission from the list of *essentials* of Vegetable and Animal Physiology and the study of Comparative Anatomy, a defect, which he would urge the Senate to supply. He thought the Bombay scheme a more complete one. The omission of English History in the lower examinations seemed a mistake, if that were restored, the objection raised by Mr. Miller would be met. He also saw no great difficulty in including some Mental Science as part of the B course for the B. A. Examination.

Mr. STEVENSON approved of the Syndicate's proposal to strike out Botany; but he differed from that body in proposing to accept the proposed B course. The Committee had been appointed because it was considered that Physical Science was more difficult than Logic, &c., and with a view to the difficulty of the optional subjects being equalized; but the Committee had followed the example of the cuckoo—had thrust out others' eggs to make room for its own! Their scheme threw out co-ordinate subjects. Their alternative was Physical Science and nothing else, or no Physical Science. In putting this monstrous alternative the Committee had, he contended, gone entirely beyond the scope assigned them. In every University the object was to give *a general liberal culture* in the course for an Arts Degree, and not to take up a specialty that should naturally follow. Now the scheme the Senate were asked to accept struck at the root of this liberal culture, and could not, in his opinion, be adopted. If accepted it would need early revision, and such constant tinkering was most undesirable, affecting most injuriously the minds of students.

Mr. SINCLAIR would second Mr. Stevenson's proposition, and on the same grounds. The B. A. Degree should be a certificate of general culture, and not be given for a specialty; and he agreed with Mr. Miller's view that the Scheme of the Committee was one-sided.

Dr. OPPERT observed that gentlemen had spoken of the omission of History, &c., as *revolutionizing* the University. Now he had heard of Englishmen boasting of their "*glorious Revolution*" (a laugh). And as to the effect of the change on B. L. students, some people thought they were too many, and that the fewer lawyers the better *(much laughter)*. When Mr. Miller spoke of the irreparable loss to students that the omission of History, &c. would be, he seemed to forget that students continue *to live* after taking the B.A. Degree. That is the time for work to be done by a man himself. It was said that students should have scope, for selection—well—yes—to a certain extent, but those able to guide *should* guide.

Col. MACDONALD remarked that the Syndicate had thought it probable that the work of the Committee might be lost from the opposition their scheme would arouse, hence the compromise now under discussion. As regards Mathematics, the Committee appeared to have lost sight of the fact that in Calcutta the option ceased with the F. A. Examination. We wish to increase the number of students of Physical Science, among other reasons in order that there may be men capable of teaching the subject in schools; but if the Committee's scheme is adopted the number of students of the subject

will be reduced. And this would not be the first unworkable scheme they had known. Sir A. Grant, when saying that the Madras University was inferior to those of Calcutta and Bombay, had admitted the superiority of the scheme of Madras for the chief degree; but there was the objection that *nobody passed it*. At the present time this was the case with some of the Medical Examinations. Mr. Stevenson had objected to constant tinkering, but the objection did not apply in this instance, as the old scheme had been in operation for seven years, during which there had been many complaints, and hence the appointment of the Science Committee, and he thought the proposals of the Syndicate would give fair play to the scheme the Committee had proposed. As to the reconsideration of the whole scheme, that had been proposed, it had found no seconder.

Mr. THOMPSON would not detain the meeting long, at so late an hour, he wished, however, to say a few words. He had remarked last Saturday that, while they thanked the Committee for this Report, they were bound to form their own opinion on the scheme recommended. He had formed his and intended to vote with the Committee in opposition to the Syndicate. He might observe that the meeting of the Syndicate at which the proposition now before the Senate was agreed on, was the smallest he had ever known, its opinion therefore carried no great weight. Since that meeting he had considered the matter, and would support the Committee. Mr. Miller had contended that nobody would select the B course, on *account* of the amount of Mathematics in it. Even if the result were to be such, he was not sure that they should vote against the Committee, for if its scheme were adopted they would gain in depth what *might* be lost in superficial extent. Col. Macdonald had said that there were no teachers, but for their production time was necessary, and they must not be in too great a hurry. In this country it seemed to be a peculiarity that people always were in too much hurry for results, and the general explanation of it was probably the short time that Europeans felt to be before them. For the same reason, they planted casuarinas, because that tree gave an early return, while the more valuable but longer-growing trees were neglected. Society is *going*, but the University will live long, we, who now form the Senate, may not see results, but the Senate will; *so slow* progress, if sure, is not objectionable. Even a few *good* sound men would be better than many smatterers, he therefore advocated the more thorough course proposed by the Committee.

Mr. RAE had a proposition to bring forward that, if accepted, might help them out of their difficulties. If it were not accepted, he need not at present say how he should vote (*a laugh*). Mr. Thompson had, as far as he could, discounted the decision of the Syndicate; and he had objected to its scheme as encouraging *smatterers in Science*. On that score he (Mr. Rae) thought there was little danger to be apprehended. He was more afraid of the results of the Committee's scheme. That would send out men stamped as Bachelors of *Arts*. Now how many *Arts* would they have as knowledge of according to the proposed scheme? History had been struck out of the course for the Matriculation Examination: the F. A. Examination required a knowledge of the English language, but nothing of History; while the proposed B course for the Degree Examination required Science, and neglected all the important collateral subjects.

To confer the Degree of Bachelor of *Arts* on men showing only a knowledge of English and of Science was, he contended, out of the question. Then to do what the Committee proposed, viz. *add* Mathematics to Physical Science, would be to add a heavy burden 'too grievous to be borne,' and to make the scheme contain the condition of certain failure. As to the Syndicate's proposition to omit Botany from the A course, he doubted whether Chemistry should not rather be left out. That was a subject which could hardly be studied afterwards by students except professionally, while Botany was a subject that any man anywhere could prosecute the study of without appliances and without expense, it was therefore admirably adapted to be a subject of self-education. He thought, however, that the question should not now be decided, and he proposed the appointment of a larger Committee to consider and report on it.

Dr. BIDIE would second Mr. Rae's proposition. There were, he considered, various objections to the different propositions before the Senate; the B scheme, for instance, he considered too Mathematical and too Physical.

The HON'BLE V. RAMIENGAR thought the present B. A. course too discursive, and that the scheme of the Committee would enable students to study one subject thoroughly. Past experience having proved the general neglect of Physical Science a knowledge of which was most useful to the country, the Senate should now go in for a more full and thorough course of study in Natural Science such as that proposed by the Science Committee after due consideration.

Dr. WILSON considered it a hopeful sign that so many were interested in the subject under discussion, though some strange things had been said. Mr. Rae, for example, was at least a quarter of a century behind the time in regard to Practical Chemistry. The old scheme was simply ridiculous. It required a cooly load of books, and it had been one of the greatest evils of his life that he had to teach under it for three years. It had been said that "The evil that men do lives after them;" so with the old scheme, its evil effects would last for a long time. The scheme now proposed by the Syndicate in preference to that of the Committee was *less* ridiculous than the old one, but still it was ridiculous. In drawing up their scheme, the Committee were quite aware, of what it had been said, they lost sight of, namely, the presence of Mathematics in the Calcutta course. He thought English and Mathematics of value only for acquiring a knowledge of Nature!

Mr. KRISHNAMACHARYAR said that he intended to vote for the Science Committee's scheme because he had heard often a charge brought against the University that it encouraged, though not deliberately, the errors of the cramming system, the text-book system being easier for purposes of examination than the one requiring some exercise of thought and comparison and observation. The University was therefore charged often with producing too many superficial graduates, and the reason indicated was that it tried to teach too much and too great a variety of matter, and it taught nothing thoroughly. It seemed to be supposed by men that every native youth who simply passed through the B. A. course should be a *well-informed* man in all branches of learning—a result not possible even to Englishmen studying in their own mother tongue, and having the advantage from their childhood of the opportunities of gathering unconsciously from educated gentlemen and ladies a large quantity of information and ideas on which to build a college education. On the other hand the native youth had to study under disadvantages. He was compelled to pick up first a foreign language which was very dissimilar to his own, and then to learn the elements of Modern Science as almost everything else through the medium of that foreign language; and he certainly had not anything like the social advantages above referred to. It was therefore unreasonable to expect from him what is impossible even for the under-graduates of English Universities. If the Senate wished to improve the present state of things, they should first discourage the present practice of picking up fragments of knowledge by merely committing to memory a vague smattering of a number of subjects such as were found in the A branch of the B. A. course. The time seemed to have come for narrowing the list of compulsory subjects, and to give the student a great freedom of choice and thus encourage special branches of study according to the taste and aptitude of each. He thought that if a number of students who had a taste for Natural Science were allowed to choose it and gain an accurate acquaintance with all its leading ideas, their interest instead of fading away after the B. A. examination, would grow in after years, and the result would benefit them and their country. Mr. Miller laid great stress on the study of History. None could deny the utility of historical studies, but he (the speaker) begged to ask whether History was not a far easier subject for a graduate to study in after years for himself than Physical Science, for the proper and intelligent study of which, experiments, illustrations and specimens were absolutely required, but could not be had except at College or School. He was pretty certain that Physical Science if not studied as a part of the College course would be never studied efficiently. Mr. Krishnamachariar added that if, as he had gathered from the remarks of some previous speakers, the thorough scheme of the Science Committee was objected to on the score of expense which perhaps several people could not afford, he thought the objection was not a sound one. If the University once recognised the knowledge of Physical Science as an essential element of high class education, then the affiliated colleges must find the money and the teaching agency necessary, or they must let go the privilege of affiliation under the rules laid down for affiliation. If the managers of any Colleges had not the requisite means for affording instruction up to the standards under which they desired to be affiliated, the sooner they gave up all pretensions to giving a higher education to native youths the better.

Mr. VENKATARAMIAH spoke in favor of referring the question to a larger Committee composed of the members of the Science Committee and other Fellows who could represent interests other than those of Physical Science; and until a fuller report was presented, he thought it impossible for the Senate to express a decided opinion.

The VICE-CHANCELLOR was surprised that the Syndicate's proposition had not at once been accepted, for it leaves the old A course as it is except Botany. Col. Macdonald had pointed out the scarcity of men competent to teach Physical Science; the University should therefore encourage its study. He did not anticipate the evils pre-

dicted by Mr. Miller, though it was possible that by the adoption of the new B course there might be fewer students under the general B. A. course. As to referring the question back, he saw no prospect of any more unanimous decision being arrived at than they had come to now, he would therefore accept the Syndicate's proposals.

Mr. Cook replied on the whole question.

The Vice-Chancellor then put to the vote the following:—

Mr. Rae's motion for a new Committee.

For 8: against 12, *lost*.

Mr. Stevenson's motion for the A course except Botany, rejecting the new B course.

For 5: against 13, *lost*.

The Syndicate's proposition.

For 13: against 8, *carried*.

The question was then referred to the Syndicate, for the elaboration of details in accordance with the Senate's decision.

Mr. Miller next proposed that the change in the Matriculation decided on at the last meeting, *viz.*, the substitution of Chemistry for Physical Geography, come into operation at the examination of December 1881.

Mr. Fowler thought the time given ample, and would second the proposition.

This was carried *nem. con.* and terminated the business.

[*To make this Report complete we give the Report of the Science Committee.*]

REPORT OF THE PHYSICAL SCIENCE COMMITTEE APPOINTED BY THE SYNDICATE.

To the Registrar of the University of Madras.

Sir,—We have the honor to submit our report as regards the subjects in Physical Science, a knowledge of which we are of opinion should be required from candidates for the examinations of the University of Madras. We have held *ten meetings* at which we have carefully considered the whole question, and we recommend that the following changes should be made in the course as now laid down in the Madras University Calendar.

2. We are unanimously of opinion that the subject "Physical Geography" should be removed from the Matriculation Examination, and that in its place the Chemistry Primer by Professor Roscoe, to the end of Article 52, should be substituted; questions of an Arithmetical character being, as far as possible, excluded from the papers on Chemistry and Physics.

3. This change having been made, we are of opinion that one three-hours' paper should be given in Physics and Chemistry, 25 marks being assigned to Physics, and 25 marks to Chemistry. This would leave 30 marks to be assigned to General Geography, and 40 marks to Indian History, as at present. The two-hours' paper in General Geography could be given from 10 to 12 on the morning of the fifth day, the three-hours' paper being given from 2 to 5 on the afternoon of the same day.

4. As regards the First Examination in Arts, we are unanimously of opinion that Huxley's Physiography, omitting Chapters 14, 15, 16, 17, should be substituted for Physiology.

5. As regards the marks to be assigned to Physiography, we are of opinion that, considering that 70 marks are assigned to History, a larger

number of marks should be assigned to Physiography than are at present given to Physiology, (namely 50), and that Physiography being the only scientific subject in the F. A. course should have the same number (70) of marks assigned to it, as is at present assigned to History.

6. The following scheme for the *B. A.* course is recommended by all of us, except Mr. Michie Smith.

(i) that from the present B. A. course the optional subject "Physical Science" shall be removed: and

(ii) that an optional (B) course for the B. A. Degree shall be instituted, so that a candidate may elect to be examined in the present course (A) as it now stands in the calendar, Physical Science being omitted from the list of Optional Subjects; or in a new course (B) to consist of the following subjects:—

(B) course for the B. A. Degree.

1. English, as in the (A) course.
2. Mixed Mathematics, as in the (A) course, but omitting "Astronomy."
3. Inorganic Chemistry, as in Roscoe or Miller.
4. Elementary Physics, as in Balfour Stewart.
5. One of the following to be selected by the candidate:
   - (*a*) Practical Chemistry.
   - (*b*) Advanced Physics, as in Ganot, omitting the more purely Mathematical parts.
   - (*c*) Vegetable Anatomy and Physiology and Systematic Botany, (Syllabus).
   - (*d*) Animal Physiology and Zoology. (Syllabus.)
   - (*e*) Geology, Mineralogy and Palæontology.

7. The following method of distributing the marks in the (B) course for the B. A. Degree is recommended by us:

(B) course: B. A. Degree Examination.

		Marks.
	English—as in the (A) course	200
Mixed Mathematics.	Statics and Dynamics... } the same papers as	60
	Hydrostatics... } in the (A) course	40
	Optics...	25
	Inorganic Chemistry (3 hours' paper)	100
	Physics (3 hours' paper)	100
	Optional Subjects (6 hours' test)	195
		720

8. The scheme we have recommended for the B. A. Degree Examination, is very similar to the scheme of the Calcutta University, and the popularity of this scheme (B) in Calcutta, and the success obtained by the candidates who have taken up this scheme, as shown by the Reports of the Syndicate of the Calcutta University, and as stated by the Registrar of that University, lead us to hope for similar results from its adoption in the curriculum of the University of Madras.

9. As regards the examination for the degree of Master of Arts, we recommend the following three branches in Science:

Branch I. (Third Branch) *Chemistry and Physics.*

1. Jevon's Principles of Science.
2. Chemistry, Inorganic and Organic, including a knowledge of Quantitative Analysis.
3. Experimental Physics, including Light, Heat, Sound, Electricity and Magnetism.

[A practical knowledge of Physical apparatus will be required.]

Branch II. (Fourth Branch) *Biology.*

1. Jevon's Principles of Science.
2. Botany } with such portions of Organic Chemistry as are
3. Zoology } necessary to elucidate the subject.

Branch III. (Fifth Branch) *Geology and Mineralogy.*

1. Jevon's Principles of Science.
2. Geology and Petrology.
3. Mineralogy and Crystallography.
4. Palæontology.

10. In the Appendix to this Report we give Syllabuses of the Optional Subjects (c) and (d) for the B. A. Examination, together with suggestions for conducting the Examination in Practical Chemistry.

We have the honour to be, Sir,
Your obedient Servants,
F. D. Evans, M.A., President.
G. K. Winter,
E. Cook.
C. Michie Smith,
C. Nagoore Row,
William H. Wilson.

APPENDIX.

(C).—Vegetable Anatomy and Physiology, and Systematic Botany.

Elementary tissues and chief chemical constituents of Plants.

Respiration, Endosmose, Ascent of sap, Fixation of Carbon, Cell formation, and Cell contents; Starch, Gum, Oil, Sugar, Wax, Alkaloids; General characters and functions of Root, Stem, (wood and bark), Leaf, Stamen, Pistil, Fruit, Seed.

Fertilization of Cryptogams and Phanogams; Germination; Propagation by Division.

Phyllotaxis; Metamorphosis; Vernation; Aestivation; Stipulation; Placentation.

Classification of Plants into Phænogams and Cryptogams; Cellular and Vascular; Acotyledons, Monocotyledons and Dicotyledons, (Angiosperms and Gymnosperms); Endogens and Exogens.

A knowledge of the characters, properties and uses of the principal Indian orders, *viz*:—

Dicotyledons.—Ranunculaceæ, Anonaceæ, Papaveraceæ, Malvaceæ, Leguminosæ, Myrtaceæ, Cucurbitaceæ, Rubiaceæ, Compositæ, Sapotaceæ, Apocyneæ, Solanaceæ, Euphorbiaceæ, Santalaceæ, Piperaceæ, Cycadaceæ.

Monocotyledons.—Palmaceæ, Aroideæ, Liliaceæ, Scitamineæ, Orchidaceæ, Gramineæ.

Acotyledons.—Filices, Musci, Lichens, Algæ, Fungi.

Demonstration of the Botanical characters of Plants, upon large and conspicuous specimens (provided by the Examiners).

Derivation and meaning of the following terms, and demonstration of their application on specimens (provided by the Examiners):—Thalamic floral, Calycifloral, Corollifloral, Hypogynous, Perigynous, Epigynous; Monandrous; Diandrous, &c.; variety, species, genus, order, class, kingdom.

(D).—Animal Physiology and Zoology.

The mechanical, chemical and vital properties of the several elementary tissues of animals.

Nature and composition of the principal substances used as food by animals.

Comparative structure and action of organs of Digestion, Absorption and Assimilation.

Composition and properties of the Chyle, Lymph and Blood.

Comparative structure, arrangements and action of the Circulatory and Respiratory organs in the animal series.

Chemical effects of Respiration, Essential structure of Secretory organs; principal varieties presented in the structure of the Liver and Kidnies.

Objects of the several Excretory processes.

Development of Heat, Light and Electricity by animals

Comparative structure and action of the Nervous system.

Comparative structure and action of the Organs of Sense.

General history of Development and Metamorphosis in the principal types of animals.

Distinctive characters and chief peculiarities of the following groups of animals, *viz*:—

Mammalia, Aves, Reptilia, Amphibia, Pisces.

Cephalopoda, Gasteropoda, Polyzoa, Insecta, Crustacea, Vermes.

Echinodermata.

Actinozoa, Hydrozoa.

Protozoa.

Recognition and description of specimens (provided by Examiners) of any of the groups above-named.

Instructions regarding the mode of conducting the examination in Practical Chemistry for the F. A. Degree Examination.

(1.) The Practical Examination in Chemistry shall be conducted in a Chemical Laboratory, each candidate being furnished with a set of reagents, and all necessary apparatus, which he shall be required to return in good order at the close of the examination, and to make good all breakages.

(2.) Each candidate shall be provided with a mixture containing not more than three acids, and three bases, the qualitative composition of which he shall be required to determine by analysis both in the dry and wet way, arranging the results of his examination in a tabular form.

(3.) The Examiner shall be instructed to give different mixtures to contiguous candidates so as to prevent collusion.

Minute by Mr. Michie Smith.

I dissent from the recommendations of the Committee for the following reasons:

(1.) I object to students being allowed to obtain a B. A. degree, for passing in the subjects suggested for the *B* course. Such a course is far more suitable for a B. Sc. degree, a degree which I am of opinion might be instituted with great advantage. The reference to the case of Calcutta seems to me of no weight inasmuch as the course for the F. A. Examination includes subjects not required in Madras for that examination.

(2.) I am of opinion that the change which is recommended will greatly discourage the study of Physical Science which seems now to be getting a real hold on the students. To compel all students who wish to take up Science to take also Natural Philosophy to the extent prescribed, seems to me to be likely to prevent many who would otherwise take up the subject from doing so; for I know from my own experience that a very small proportion of students who study for the B. A. degree have any taste for Mathematics, either pure or applied, while a large proportion seem to have a liking for experimental science.

Were Physical Science left as an optional subject in the *A* course, this second objection would of course not hold.

(3.) I object also in the course prescribed for the M. A. degree, Branch

I, to the part "A practical knowledge of Physical apparatus will be required." There is no Laboratory, so far as I am aware, in the Madras Presidency, where such a knowledge can be acquired and to prescribe it is practically to render it impossible for any student to take up this branch.

C. MICHIE SMITH.

Resolution of the Syndicate.

The Syndicate accept the proposals as to the Matriculation Examination.

As regards the F. A. Examination they consider that the subject of Physiology should be retained, but in a more complete form, and that an easier text-book should be substituted.

With regard to the B. A. Examination the Syndicate accept what is proposed as to a B course, but they think that in the A course, Physical Science should be retained, striking out only Botany.

The Syndicate do not disapprove of the proposals for the M. A. Degree.

ANALYSIS OF THE MATRICULATION LIST, 1879.

Rank.	Names of Institutions.	Number Passed. First Class.	Second Class.	Total.
1	Madras Christian College.....	4	49	53
2	Kumbhakonum College.....	5	40	45
3	Presidency College.....	2	43	45
4	Trevandrum Maharajah's Col..	...	43	43
5	Trichinopoly S.P.G College....	2	40	42
6	Pachiappa's High School.....	2	33	35
7	Kumbhakonum Native Hig. Sch.	1	34	35
8	Calicut Kerala Vidyasala.....	1	29	30
9	Kumbhakonum Town School....	2	27	29
10	Coimbatore College.....	...	29	29
11	Mangalore Government College.	3	23	26
12	Calicut do. ...	1	24	25
13	Tanjore S.P.G. College.....	1	24	25
14	Tinnevelly Hindu College.....	1	23	24
15	Rajahmundry Govt. College.....	3	20	23
16	Madura Govt. High School.....	...	19	19
17	Negapatam St. Joseph's College	...	16	16
18	Bangalore Central College.....	3	12	15
19	Mysore Maharajah's College....	2	13	15
20	Salem Government College.....	...	15	15
21	Royapettah West. M. High Sch.	...	15	15
22	Palghaut Govt. High School....	...	15	15
23	Nellore F. C. M. School.....	...	15	15
24	Masulipatam Hindu High Sch.	1	13	14
25	Bangalore Wes. Mis. High Sch.	...	14	14
26	Vizianagaram College.....	2	11	13
27	Ch. of Scot. Mis. Ins. Madras ...	1	12	13
28	Mysore Wes. Mis. High Sch. ...	...	13	13
29	Bangalore London Mis. Hh.Sch.	...	12	12

Analysis of the Matriculation List, 1879—(Continued.)

Rank.	Names of Institutions.	Number Passed. First Class.	Second Class.	Total.
30	Cuddalore Government College.	...	10	10
31	Vepery S.P.G. High School.....	2	7	9
32	Ernakulam High School.....	1	8	9
33	Bellary London Mis. High Sch..	...	9	9
34	Negapatam Wes. Mis. H. Sch....	1	7	8
35	Conjeveram F. C. M. School.....	1	7	8
36	Masulipatam Noble College.....	...	8	8
37	Sawyerpuram S. P. G. Seminary.	...	8	8
38	Vizagapatam London M. H. Sch.	...	8	8
39	Doreton Protestant College.....	1	6	7
40	Manargudi Wes. Mis. High Sch.	1	6	7
41	Bishop Corrie's Grammar Sch..	...	7	7
42	Berhampore Government Coll..	...	7	7
43	Chillambrum Pachiappa's H.S...	...	7	7
44	Manargudi Native High School.	...	7	7
45	Palamcotta C. M. S. Institution.	...	7	7
46	St. Thomé Seminary.....	...	7	7
47	Vizagapatam Hindu College....	...	7	7
48	Chittoor Govt. High School.....	1	5	6
49	Kurnool do. ...	1	5	6
50	Narsapur Mission School.....	...	6	6
51	Nellore Hindu High School.....	...	6	6
52	Bangalore Bishop Cotton's Col..	1	4	5
53	Cottayam C. M. S. College.....	1	4	5
54	Bellary Government College.....	...	5	5
55	Chingleput F. C. M. School.....	...	5	5
56	Madras St. Andrew's School.....	...	5	5
57	Palamcotta Hindu High Sch.....	...	5	5
58	Shimoga Government College...	...	5	5
59	Tranquebar Lutheran Central S.	...	5	5
60	Hyderabad Nizam's High Sch...	1	3	4
61	Do. St. George's Gr. Sch.	...	4	4
62	Tellicherry Govt. High School...	...	4	4
63	Ramnad S.P.G. High School.....	...	4	4
64	Pasumalai American Mis. Sch...	...	4	4
65	Mysore Marimalappa's School...	1	2	3
66	Bezwada C.M.S. High School...	...	3	3
67	Cuddalore St. Joseph's School...	...	3	3
68	Cuddapah Govt. High School ...	...	3	3
69	Hassan High School.....	...	3	3
70	Madras London Mis. High Sch..	...	3	3
71	Do. St. Mary's Seminary.....	...	3	3
72	Madura Central High School....	...	3	3
73	Saidapet Govt. High School.....	...	3	3

Analysis of the Matriculation List, 1879.—(*Concluded.*)

Rank.	Names of Institutions.	Number Passed.		
		First Class.	Second Class.	Total.
74	Trivellore F. C. M. School.....	...	3	3
75	Tinnevelly Central High Sch....	...	3	3
76	Cocanada Hindu High School...	...	2	2
77	Conjeveram Pacheappa's Sch....	...	2	2
78	Jaffna Central School.....	...	2	2
79	Madras Hindu Proprietary Sch.	...	2	2
80	Narasapur Central High Sch..	...	2	2
81	Tinnevelly C. M. S. High School.	...	2	2
82	Triplicane Harris School.....	...	2	2
83	Do. A. V. School.....	...	2	2
84	Storford Bishop's Grammar Sch.	1	...	1
85	Bangalore St. Joseph's Semry...	...	1	1
86	Cannanore Govt. High School...	...	1	1
87	Chicacole Christian High Sch...	...	1	1
88	Do. High School	...	1	1
89	Coimbatore London Mis. H. Sch.	...	1	1
90	Collengode M. C. School.....	...	1	1
91	Colar Government High Sch.....	...	1	1
92	Dindigul American Mis. Sch.....	...	1	1
93	Guntur Mission High School ...	...	1	1
94	Mangalore Saraswat School.....	...	1	1
95	Nagercoil London Mis. Semry...	...	1	1
96	Porayar S. P. G. High School...	...	1	1
97	Pondicherry Subbroya Chettiar's College.....	...	1	1
98	Salem London Mis. High Sch...	...	1	1
99	Srivulliputtur C. M. S. A. V. Sch.	...	1	1
100	Trichinopoly Hindu High Sch...	...	1	1
101	Tumkur Govt. High School.....	...	1	1
102	Vizagapatam St. Aloysius Sch..	...	1	1
	Private Study	...	89	89
	Total...	51	1,043	1,094

The following table brings together the results of the Matriculation Examinations for the chief institutions during the last 9 years :—

Rank.	Names of Institutions.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	Total.
1	Kumbhakonam College.....	20	53	76	73	58	60	74	46	45	331
2	Trevandrum Maharajah's College	29	50	36	51	49	48	...	52	43	360
3	Madras Christian College	21	26	38	35	27	30	33	6	35	285
4	Presidency College.....	22	7	24	28	29	46	33	18	45	252
5	*College of Government College*.....	15	28	20	33	32	39	21	14	25	234
6	Trichinopoly S. P. G. College	8	22	18	20	21	31	30	7	42	228
7	Pachiappa's High School, Madras	16	20	14	20	20	44	28	14	35	221
8	Tanjore S. P. G. College	12	15	35	30	18	44	27	6	25	212
9	Mangalore Government College.....	10	15	28	15	20	28	28	16	20	190
10	Coimbatore College.....	4	12	12	17	28	29	24	8	29	163
11	Rajahmundry Government College	4	7	14	20	12	31	20	8	23	139
12	Madura Government High School.....	5	14	7	10	12	23	17	3	9	110
13	Negapatam St. Joseph's College.....	7	12	11	10	11	14	12	8	16	101
14	Tinnevelly Hindu College.....	5	5	10	13	13	20	2	8	24	100
15	Bangalore Wes. Mission High School.....	9	7	6	13	9	22	3	1	11	89
16	Nellore F. C. M. School	9	7	6	12	6	21	8	3	15	87
17	Central College, Bangalore	11	10	8	11	6	12	9	4	15	86
18	Bellary Government College	20	12	15	12	4	14	3	...	5	85
19	Palghaut Government High School	...	7	6	14	9	20	7	3	15	82
20	Masulipatam Hindu High School	8	6	4	8	11	12	15	3	14	81
21	Chittur Government High School	10	17	7	13	10	8	9	3	6	80
22	Ernakulam High School	3	6	6	11	11	24	8	4	9	80
23	*Bishop Corrie's Grammar Sch.* Madras....	8	7	11	11	13	8	6	2	7	76
24	Masulipatam Noble College.....	10	11	8	3	7	16	7	3	4	73
25	Vepery S. P. G. High School.....	3	10	7	11	4	16	9	4	9	73
26	Salem Government College	6	7	3	9	9	9	9	3	15	70
27	Doveton Protestant College, Madras...	8	12	9	7	4	8	11	6	7	66
28	Mandegadi Wesleyan Missio High Sch	1	7	4	7	9	16	10	4	7	65
29	Royapettah do.	1	3	7	8	5	13	5	5	13	60
30	Bangalore London Mission High School	3	4	3	4	5	16	7	2	12	56
31	C. M. S. College, Cottayam	1	6	4	9	5	10	8	3	5	51
32	Mysore Maharajah's College.....	3	4	5	2	3	4	8	4	5	53
33	Bellary London Mission High School.....	1	3	3	7	4	9	2	1	6	51
34	Chillambrum Pachiappa's High School....	1	4	3	3	4	12	6	1	7	51
35	Negapatam Wes. Mission High School.....	2	4	7	6	7	10	4	1	8	50
36	Berhampore Government College	2	8	1	7	8	12	8	1	7	47
37	Cuddalore do. ...	2	3	1	3	5	12	7	5	10	47
38	St. Mary's Seminary, Madras.	2	2	6	5	5	12	4	1	3	43
39	Conjeveram Pachiappa's High School	3	4	2	8	4	11	1	2	2	42
40	Madras London Mission High School.....	2	5	2	4	6	7	3	3	3	35
41	Vizagapatam Hindu College.....	...	1	3	6	2	6	5	4	7	35
42	Sawyerpuram S. P. G. Seminary	2	3	1	...	...	10	5	5	8	34
43	Cuddapah Government High School.....	2	3	...	2	1	5	3	2	3	33
44	Kurnool do. ...	2	3	3	4	2	7	2	1	6	30
45	Saidapet do. ...	6	3	4	5	1	2	2	3	3	29
46	Narsapur Central High School	2	4	2	...	...	2	7	2	2	21
47	Ramnad S. P. G. High School	...	...	...	2	5	7	2	3	4	23
48	Cannanore Government High School.....	3	...	1	...	...	8	4	5	1	22
49	Sullivan's Garden Seminary	1	1	3	2	2	4	5	1	...	19
50	Pasumalai American Mission School.....	...	...	...	...	...	...	...	...	4	4

EXAMINATION FOR SCHOOLMISTRESSES' CERTIFICATES DEC. 1879.

Analysis of Results.

School.	Number sent in and passed.								
	i. Grade.			ii. Grade.			iii. Grade.		
		Passed.			Passed.			Passed.	
	No. sent in.	1st Class.	2nd Class.	No. sent in.	1st Class.	2nd Class.	No. sent in.	1st Class.	2nd Class.
Government } Normal Class ...	5	...	...	3	1	...	4	...	2
Female Normal S. } Practising Dept.	11	1	6	9	1	5	13	4	4
Presentation Convent School	4	...	2	8	2	2	17	62	4
Davidson Street	3	...	1	8	...	4	12	5	5
Military Female Orphan Asylum ...	3	2	1	7	2	3	6	4	2
Lawrence Asylum	2	1	1	4	2	2	8	8	...
Wesleyan Mission Day, Madras ...	5	...	4	5	2	1	6	4	1
Mrs. Koldhoff's Seminary	2	...	1	6	...	4	9	5	...
Civil Orphan Asylum	2	...	1	6	...	3	10	...	6
Christian Female Normal	6	...	3	9	1	...	11	2	3
Wesleyan Mission Day, Bangalore ...	4	...	2	6	1	2	2	1	1
St. Ann's Convent, Mangalore	1	...	1	6	...	4	3	2	...
St. Joseph's Convent, Calicut	1	...	...	4	...	1	4	2	2
Christ Church, Mount Road	1	...	1	4	...	1	2	1	1
Emmanuel Church	1	...	...	1	...	1	5	2	1
Coimbatore Day	1	...	...	6	...	1	3	1	1
Bishop Corfe's, Bangalore	3	...	...	...	...	...	1	...	1
Sarah Tucker Inst., Palamcottah ...	...	...	...	16	6	8	22	13	8
Poyeton Girls'	...	...	...	3	2	1	15	7	3
Training, Mogamuppalam	...	...	...	1	1	...	10	9	1
St. Francis Xavier's, Madras	...	...	...	5	...	1	7	1	5
F. C. Mission Boarding, Madras ...	...	...	...	5	...	1	8	4	1
Do. Cicotti, do. ...	...	...	...	7	2	3	1	...	...
London Mission, Boarding	...	...	...	3	...	2	7	1	2
St. John's Parochial, Bangalore ...	...	...	...	3	...	1	3	2	1
Fort Catholic	...	...	...	4	...	2	7	1	...
Royapetta Catholic	...	...	...	1	...	1	2	2	...
Cocnoor Day	...	...	...	1	1	...	1	1	...
Wesleyan Mis. Boarding, Royapetta. ...	...	...	...	3	...	1	4	1	...
English, Salem	...	...	...	1	...	1	1	1	...
St. Thomas', St. Thome	...	...	...	1	...	...	1	1	...
Grade, Edeyengudy	...	...	...	...	...	...	10	8	1
Nazareth Convent, Ootacamund ...	...	...	...	...	...	...	11	7	2
Boarding, Palamcottah	...	...	...	...	...	...	8	7	1
Training, Nazareth	...	...	...	...	...	...	7	7	...
Basel Mis. Eva. Boarding, Calicut ...	...	...	...	...	...	...	7	5	2
Am. Mis. Tra., Madura	...	...	...	...	...	...	7	2	4
Free Church Mission Day	...	...	...	...	...	...	11	2	2
Caste, Tanjore	...	...	...	...	...	...	4	2	2
American Mis. Seminary, Chittoor ...	...	...	...	...	...	...	4	1	...
Fort, Vellore	...	...	...	...	...	...	5	3	...

EXAMINATION FOR SCHOOLMISTRESSES' CERTIFICATES DEC. 1879.

Analysis of Results—(Continued.)

School.	Number sent in and passed.								
	i. Grade.			ii. Grade.			iii. Grade.		
		Passed.			Passed.			Passed.	
	No. sent in.	1st Class.	2nd Class.	No. sent in.	1st Class.	2nd Class.	No. sent in.	1st Class.	2nd Class.
Indian Instruction Soc., Madras ...	...	...	...	...	...	...	5	2	1
Ch. of England, Rajahmundry ...	...	...	...	...	...	...	3	2	...
Vizagapatam Orphan Asylum	...	...	...	...	...	...	3	1	1
S. P. G. Boarding, Ramnad	...	...	...	...	...	...	4	...	2
Government Girls', Nellore	...	...	...	...	...	...	3	1	...
Do. Salem	...	...	...	...	...	...	1	1	...
English, Cuddalore	...	...	...	...	...	...	2	1	...
London Mis., Purseiwalkam	...	...	...	...	...	...	2	1	...
Army, Palamcottah	...	...	...	...	...	...	1	1	...
Municipal, Kumbhakonam	...	...	...	...	...	...	2	1	...
F. G. M. Balika Patasala	...	...	...	...	...	...	2	1	...
St. Peter's, Royapooram	...	...	...	...	...	...	3	...	1
All Souls', Coimbatore	...	...	...	...	...	...	1	...	1
Government, Pattukottai	...	...	...	...	...	...	1	...	1
S. P. G. Boarding, Tanjore	...	...	...	...	...	...	4	...	1
Private Study.	8	2	3	12	1	8	14	4	5

The Convocation of the Calcutta University was held on the 13th Instant. The address was delivered by Sir Alexander Arbuthnot, the Vice-Chancellor. In the year the University admitted on its rolls 1,029 undergraduates, 320 students who passed the First-in-Arts examination, 112 obtained the degree of B. A., of whom the greater number passed from the Presidency and General Assembly's Colleges; thirty-two passed the degree of M. A., of whom 20 were from the Presidency College; forty-seven candidates passed the B. L. degree; one passed another law examination; one the degree of Doctor of Medicine; ninety passed the lower examinations in medicine. Twenty-six candidates who went up for the degree in Civil Engineering, failed. Altogether 4,338 candidates appeared for the different examinations of whom 1,632 were successful. The Cobden Club in London has founded a silver medal in the University to be awarded to the student who passes the M. A. degree in History and Political Economy. A gold medal has been founded in the University in the name of Sir William Herschel to be awarded to the student who passes the degree of B. A. in Astronomy. A wealthy zemindar of Pachet has founded a Sanscrit prize in connection with the First-in-Arts examination. The Vice-Chancellor, alluded in his speech to the deaths of Lord Lawrence, who for five

years was Chancellor of the University, of Sir John Law, one of the original fellows of the University and who was a member of Lord Dalhousie's council; and of the Rev. C. E. Vines, a graduate of Trinity College, Dublin, and for many years Principal of St. John's College, Agra. The results of the last University Examinations in Madras show that 1,094 candidates passed the Matriculation Examination, 294 the First-in-Arts, eighty-five the degree of B. A.; four the degree of Bachelor of Laws; two the M. A. degree and five the degree of Bachelor in Civil Engineering. In the examinations, Bengal beats Madras in all but the B. C. E. and Matriculation.

CORRESPONDENCE.

PUNCTUAL ATTENDANCE OF TEACHERS.

TO THE EDITOR OF THE MADRAS JOURNAL OF EDUCATION.

SIR,—I request you will kindly give insertion to the following and enlighten me on the point therein referred to.

It is laid down in the Standing Orders that schools are to begin at 10 A.M., and again at 2 P.M. Now in almost every school the bell is rung five minutes before the time appointed. This, I suppose, is to forewarn the teachers as well as the pupils of the approach of the time for the commencement of their work, that they may be prepared to enter upon the business of the day at the time fixed. It is my humble opinion that every teacher that takes real interest in his work should be in the school premises when the bell rings, if not earlier; and all those that present themselves later, should be reckoned late. But there is a variety of opinion among the teachers of several Institutions in this respect. Some think that the preparatory notice is intended for the pupils only, and that they are not required to attend a second prior to the time fixed by the Director. Can it be supposed for a moment that the boys will assemble at their respective places on hearing the notice given, if the teacher is not at the spot? Others go the length of maintaining that stepping into the school-house, nay, into the school compound when the clock strikes 10 or 2 o'clock is punctuality, and is in consonance with the ruling laid down in the Standing Orders for commencing schools.

I therefore solicit you will be so kind as to record your decision in the matter which will be authoritative and unquestionable and will be a guidance to teachers of all schools, coming as it does from the leading Educational Journalist of this Presidency.

10th April 1880. A HEADMASTER.

[Certainly, every Teacher should be in his place in the School-room at least five minutes before the hour for commencing School.—ED. M. J. OF E.]

WE have much pleasure in giving prominence to the following letter from Mr. Runganada Sastri to the *Madras Times*:

SIR,—I shall feel greatly obliged to you for inserting this letter in an early issue of your journal.

In the highly flattering notice of my scholastic and official career published in your issue of the 29th *ultimo*, some facts, that I consider worth mentioning, are not stated. When I was a youth of sixteen, I was living at Chittore, and it was my good fortune to become acquainted with the Rev. J. Bilderbeck. That gentleman, with a kindness and charity, for which I can never feel adequately grateful to him, taught me the rudiments of the English language. For more than eighteen months he helped me in learning to read and write; and, when it is borne in mind how very uninteresting and positively wearisome are the details connected with such work, it will be apparent what sacrifices he must have made to benefit me. He then introduced me to Mr. Cassamajor, of the Madras Civil Service, who, in addition to helping me most liberally with books and money, took the trouble of teaching me himself and continued to watch my career with paternal interest. This benevolent gentleman recommended me to the Rev. Mr. G. N. Groves (of the Plymouth Brethren) at Chittore, under whom I studied for three years. During my stay at Chittore, my education was anxiously watched by Messrs. Bilderbeck, Cassamajor, Best and Groves; and when it was found necessary to put me into a proper school, I was sent over by Mr. Cassamajor to Bishop Corrie's, which was then presided over by Mr. J. Kerr, who was so very kind as to give me a couple of hours' private instruction every day. After remaining for about two years at Bishop Corrie's, I was directed by my old patron, Mr. Cassamajor, to see Mr. George Norton, who got me admitted into the High School then recently established. After studying under Mr. E. B. Powell for about five months, I was considered to be fit to receive a First Class Proficient's Certificate. That after such a short course of study at the High School, I should have been able to earn a Certificate of proficiency shows what care and pains were bestowed upon my education by the gentlemen already referred to. Even after leaving School, Mr. Powell continued to help me in studying the higher mathematics for about three years.

My object in writing this to you, is to express publicly my gratitude to all the gentlemen who helped me, when I was poor and young, and to whose disinterested exertions I owe what little success I have achieved in life. I cannot conclude without special reference to the Rev. J. Bilderbeck, who has always been to me, and will, I pray, long continue to be, a most valued friend and counsellor.

I remain Sir,
Your obedient servant,

Tondiarpet, 2nd April. C. RUNGANADA SHASTRY.

Middle School Examination.

SIR,—With your permission, I should like to point out that the portions prescribed in Latin for the Middle School Examination are somewhat above the standard. The whole of Syntax according to the Public School Latin Primer, and Cæsar's De Bello Gallico, Liber I. are what even a matriculate of our University hardly possesses. Our boys begin their Latin in the Fourth Upper class. The Director of Public Instruction wishes that they should get up the portions appointed within the first year, a feat which they cannot creditably perform, or they should begin their Latin a little earlier, a course neither practicable nor advisable. I do not know whether Latin can be taught profitably in the second class. I would suggest Arnold's First Latin Book for Grammar and construing an epitome *Sacræ Historiæ* for prose text. The Edinburgh Latin Delectus might also be recommended.—*Madras Standard*. M.

UNIVERSITY SYLLABUS.

THE following list of subjects for the Matriculation, F.A., B.A., and [illegible] Examinations is published for general information :—

LANGUAGES.

MATRICULATION—1881.

English.

Selections to be published by the University.

Sanskrit.

Ramayanam—Balakanda, Cantos 68 to 77 inclusive.
Panchatantram—First Book, Calcutta Edition, page 40.

Greek.

Euripides—Hecuba.
Xenophon—Anabasis, Lib. VI, VII.

Latin.

Vergil—Aeneid, Lib VI.
Caesar—De Bello Gallico, Lib. II.

Arabic.

Intikhab-i-Nafhat-ul-Yaman—(Second half).
Ikhwan-us-Safa—First two Messengers.

Persian.

Ruz-Namah-i-Safr-i-Farangistan—(to the end of the journey in Belgium).
Selections from Mazhar and Hafiz in the La-al-i-Mauzumah.

Tamil.

Bharata Venba—First 100 Stanzas.
Eladi—First 50 Stanzas.
Panchatantram—First two books.

Telugu.

Harischandropakhyanamu—Canto 3.
Bhaskaramathakamu—The whole.
The Story of Kusalavas—By K. Anantachariyar.

Kanarese.

Ramayana—Balakanda, 7, 8, 9, &c., eight Sandhis.
Kathasangraha—Part I, first 130 pages.

Malayalam.

Panchatantram—Tantrams II, III, and IV.
Kerala Visesha Mahatmyam by P. Kumara Pillai.

Urdu.

Makhazan-ut-twarikh—(Nuks' oundi Press, Bangalore).
Devan-i-Goya.

Uriya.

Mahabharata—Birat Parva.
Raghuvansa.
Batris Singhasan.

FIRST EXAMINATION IN ARTS—1882.

English.

Milton—Paradise Lost, Book II.
Shakespeare—Henry V.
Tennyson—Enoch Arden.
Hutton—English Men of Letters : Scott.
Motley—Rise of the Dutch Republic. The Introduction and Part I.

Sanskrit.

Kumara Sambhava—Cantos 1—7 inclusive.
Malavikagnimitra.

Greek.

Sophocles—Antigone.
Herodotus—Lib. VIII and IX.

Latin.

Vergil—Georgics, Lib. IV.
Horace—Odes, Lib. I and II, omitting Odes 4, 5, 13, 17, 19, 23, 35, 33, 36 of Lib. I and Odes 4, 5, 8, 11 of Lib. II.
Cicero—Divinatio in Q. Caecilium—In Verrem (Oratio Prima).
Livy—Lib. XXII.

Arabic.

Intikhab-i-Nafhat-ul-Yaman Alf Laila—Nights 1 to 25 inclusive.

Persian.

Ruz-Namah-i-Safr—Ferangistan.
Bostan—Chapters 6, 7, 8, 9, 11.

Tamil.

Naishadam—From 8 to 14 Padalam (Expurgated Edition).
Nakadiyar—Second 10 Chapters.
Periyapuranam Prose—Tirunindra Sirukam and Tillai Valandanar Sarukam by Valayuda Mudaliar.

Telugu.

Manucharittera—Canto 6.
Acha-Telugu Bharatam—Canto 2.
Niti Chandrika—By Chinnaiah Suri, Part 2.

Kanarese.

Vrishabhendravijaya—5, 6, 7, 8, 9 Sandhis.
Mudrâmanjusha—3, 4, 5, 6, 7, 8 Asayah.

Malayalam.

Nalacharitam—The whole.
Narayaniyam—Ramayanam and Parasuramu Charitam with Vyakhyanam, published by Kerala Varman Tiramalpad (Trivandrum). Dasakams 34, 35, and 36.

Urdu.

Muntakhabat-i-Mir Dard va Sonda.
Naldaman-i-Urdu.
Gulistan—(Book Society's Edition).

Uriya.

Charee Patha—Part II, By Beechund Putnaik (printed at the Baptist Mission Press, Calcutta).
Mahabharat—Bhirat Parva (Calcutta School Book Society).
Nitibodh—(Calcutta School Book Society).

B.A. DEGREE EXAMINATION—1883.

English.

Shakespeare—Twelfth Night.
Chaucer—Knight's Tale.
Shelley—From "Prometheus Unbound :" (1) Act II, Scene 3 ; (2) The Speech of Asia : "Who reigns ? There was the Heaven and Earth at first ;" (3) Act II, Scene 5.
From "Hellas ;" (1) The Chorus beginning "Worlds on Worlds are rolling ever ;" (2) The last Chorus beginning "The World's great age begins anew."
Lyrics : (1) The Cloud : (2) To a Skylark : (3) Arethusa : (4) The Recollection : (5) To a lady with a Guitar.

Blackie—Self-culture.
Bacon—Essays omitting Nos. 37, 45, and 46.
Helps—Realmah, omitting the Conversations.

Sanskrit.

Dasakumaracharitra—pages 1 to 55 (Calcutta Edition).
Malati Madhava.

Greek.

Aeschylus—Coephoroe.
Plato—Apology of Socrates.

Latin.

Lucretius—De rerum Natura, Lib. II.
Horace—Ars Poetica.
Cicero—De Officiis.
Tacitus—Annal., Lib. XV.

Arabic.

Ajaibul-Ujab—Fifty Letters.
Ikhwan-us-Safa.

Persian.

Masnavi-Moulana Rumi—(1st Daftar).
Jahan Kusha-i-Nadiri—(First half).

Tamil.

Ramayanam—Balakandam—From 10th Padalam to the end (M. S. B. S. Edition).
Kural—From 81 to 94 Chapter, with the Commentary of Parimelazhagar.
Bhagavata Puranam—First 226 Stanzas.

Telugu.

Amuktamalyada—Canto 6.
Harivamsam—Part I, Canto 4.
Sumanomanobhiranjanam—Canto 3.
Biographies of Telugu Poets—Part II, by Sriramamurti Garu.

Kanarese.

Rajasekhara—3rd Aswasa.
Jaimini Bharata—5, 6, 7 Sandhis.
Kalivatiparinaya—First 105 pages (Vichâradarpana Press).

Malayalam.

Narayaniyam—The 12th, 18th, 24th and 26th Dasakams with Vyakhyanams published by Keralavarman Tirumulpad (Trivandrum).
Bharatam—Sambhava Parvam from Kacha's Studentship under Sukra.

Urdu.

Bustan-i-Hikmat.
Fasana-i-Ajaib—(First half).
Devan-i-Zouk.

Uriya.

History of England—By Gudha Dhar Tripathy (Calcutta School Book Society).
Sesuliya Rahha—(Calcutta School Book Society).
Ramayana—Sundra Kand (Calcutta School Book Society).

HISTORY.

First Examination in Arts—1882.

The Gracchi: Marius and Sulla.

B.A. Degree Examination—1883.

The Normans in Europe.

M.A. Degree Examination—1883.

Athens: from Solon to Demosthenes.
The Age of Charles V.

ETHICS.

M.A. Degree Examination—1883.

Plato's Republic.
Kant's Metaphysic of Ethics.

M.A. Degree Examination—1883.

English.

Chaucer—Wife of Bath's Tale.
—Clerk's Tale.
—Squire's Tale.
Shakespeare—Henry V.
—Measure for Measure.
Massinger—The Fatal Dowry.
Milton—Paradise Regained, Books III, IV.
Byron—Childe Harold, Books III, IV.
Tennyson—The Princess.
Johnson—Lives of the Poets (Dryden).
De Quincey—Confessions.
Coleridge—Wallenstein.
Carlyle—French Revolution, Vol. II.

Sanskrit.

Rig-Veda, First Mandala, Hymns XXV to XXXVI inclusive (according to the Pada or Samhita Text published by Prof. Max. Müller in 1873) with Sayana's Commentary.
Manu—Books II, VII, VIII.
Purvabhaga of the Kadambari.
Mrichchhakati.
Kalidasa—Vikramorvasi.
Bhavabhuti—Uttara-rama-charita.
Kalidasa—Megha-duta.
Tarkasangraha, together with the Tarkadipika.

Greek.

Æschylus—Septeni Contra Thebas.
—Eumenides.
Homer—Iliad, Lib. IV, V, VI.
Thucydides—Lib. VI, VII, VIII.
Aristophanes—Nubes.
—Ranae.
Demosthenes—De Corona.
—Philip III.
Plato—Phaedo.
—Symposium.
Aristotle—Eth., Lib. VII, VIII, IX.

Latin.

Vergil—Georg., Lib. III.
Horace—Epistolae.
Plautus—Mercator.
—Trinummus.
Terence—Eunuchus.
—Adelphi.
Cicero—Epistolae.
Livy—Lib. XXI—XXX.
Tacitus—Annal., Lib. VI.
Pliny—Hist. Nat., Lib. VIII, IX, X.

THE POWELL STATUE.

THE satisfactory duty of unveiling the statue of Mr. Eyre Burton Powell, C.S.I., late Director of Public Instruction, Madras, placed in the Presidency College as a tribute of affection and respect by his numerous grateful pupils in Southern India, was performed yesterday evening before one of the largest and most influential assemblies that come together on public occasions in Madras. The statue stood within a screened enclosure, and around it were gathered the ladies and gentlemen invited to witness the interesting ceremony of unveiling. His Grace the Duke of Buckingham and Chandos accompanied by the Lady Mary Grenville arrived at 5 o'clock and was received with due ceremony by the members of the Committee.

The proceedings were begun by Rr. Y. Venetaramiah Garu reading the following report :—

Early in the year 1875, it became generally known that the then Director of Public Instruction, E. B. Powell, Esq., C.S.I., was to retire from the public service and from this country. It was at once felt by the leading members of the Native Community that the long and eminently successful labors of this great Educationist during a period of 35 years in the cause of Native Education and enlightenment in Southern India, deserved a fitting recognition at their hands, and accordingly a meeting was convened in Patcheappa's Hall in February 1875 which was attended by a large and influential body of the Native public. It was resolved at this meeting that a valedictory address should be presented to Mr. Powell before his departure from Madras, and that a subscription should be raised for the erection of a statue of that gentleman as a durable monument of his valuable services as the first Principal of the Presidency College and as one of the earliest and most successful laborers in the cause of secular education. It was further resolved to place this statue in the College as the scene of Mr. Powell's chief labors in this Presidency.

A Committee was appointed to give effect to these resolutions, and subscriptions were invited at the same time. This met with a response which exceeded the most sanguine expectations, and a sum of upwards of Rs. 12,000 was subscribed within a short time, their Highnesses the Maha Rajahs of Travancore and Cochin, the Maha Rajah Holkar, H.H. the first Prince of Travancore, the Maha Rajah of Vizianagaram, the Zemindars of Nakkapelli and Ankapalli, Nuzwid and Pittapur having headed the list with liberal subscriptions.

An address was presented to Mr. Powell on the eve of his departure in March 1875 at Patcheappa's Hall, in the presence of a large assembly of the most influential members of the European and Native communities.

The Committee lost no time in placing themselves in communication with friends in England for the purpose of selecting a competent artist and carrying out the wishes of the subscribers in respect to the statue. Mr. H. D. Phillips, late of the Madras Civil Service and a friend of Mr. Powell was applied to and readily offered to assist the Committee; and at his suggestions, Mr. J. D. Sim, C.S.I., also a retired Madras Civilian, and Mr. Fortey, Inspector of Schools, 2nd Division, under the Madras Government (then in England), also friends of Mr. Powell who obligingly consented to assist the Committee, were subsequently associated with Mr. Phillips to make the

necessary arrangements for the statue, and superintend its execution. After much consideration, a rising sculptor, Mr. John Adams Acton, was selected for the task of executing the work, he having proved particularly successful in executing for St. George's Hall in Liverpool a very fine heroic statue of Mr. Gladstone in his robes as Chancellor of the Exchequer, and also one of colossal size of Sir Titus Salt. This artist estimated that 1,000 guineas would cover the expense of a statue, 8 feet high, and of the best Sicilian marble, and recommended marble as being preferable to bronze both for effect and indoor situation, where no injury could be feared from weather or accidents. The Committee were in a position before the close of 1875 to entrust the work to Mr. Adams Acton, and it is only just to this gentleman to say that he successfully completed the task in a little more than two years and therefore with very great expedition. The Committee have been fortunate in placing themselves in Mr. Acton's hands.* Such of Mr. Powell's friends of England, as have from time to time visited Mr. Acton's Studio while he was prosecuting his task, and eventually saw the statue when finished, are of opinion that the artist has been most successful in all respects; and the Committee have thus the pleasure of witnessing the result of his labors in a work of art which they trust is not only an excellent likeness of Mr. Powell, but an ornament to this College. It is computed to weigh about six tons, and the entire cost including the shipping charges, &c., has amounted to Rs. 13,055-7-3. A statement of the receipts and disbursements on account of the fund is annexed.

On the arrival of the statue from England about the close of the year 1878, the site for erecting it was fixed in the first instance in communication with Mr. R. F. Chisholm the Civil Architect, in the entrance Hall of the ground-floor of the College, but it was afterwards thought by some of Mr. Powell's European friends (Mr. Justice Innes, Colonel Macdonald and Messrs. Fortey and Thompson to whom the thanks of the Committee are due) that a better and more elevated place for the statue could be found under the dome in which we now find it. The original site was accordingly abandoned and the statue has since been placed in position, as we now find it, with great skill, by Mr. Chisholm and at the expense of the gentlemen already named.

The Committee are under great obligation to Mr. H. D. Phillips and the two other gentlemen associated with him, who, from first to last, have taken the deepest interest in the work confided to them, and to whose judicious selection of a competent artist in the first instance and to their subsequent unremitting care and attention is due the early and successful completion of the statue which His Grace the Governor has so kindly consented to unveil this evening.

The Hon'ble V. Ramiengar, C.S.I., on behalf of the Committee, in the following terms, requested His Grace to unveil the statue :—

MY LORD DUKE, LADIES AND GENTLEMEN,—After the report which has been just read, it only remains for me, on behalf of the Committee, to ask your Grace to unveil this statue—not of a soldier who, by his achievements, has added to the military glory of his country—not of a statesman who has proved himself a "pilot in extremity," and safely steered the vessel of State through a sea of political troubles—not of a philosopher who has extended the dominion of man over the forces of nature—not of a philanthropist who has "dived into

the depths of dungeons, and plunged into the infection of hospitals to alleviate human misery and sorrow, but of a humble schoolmaster who, by simply doing his duty—by keeping to that "path which" according to the Poet, "all may tread," has earned for himself the respect and gratitude of the natives of this Presidency. Mr. Powell first came out to this country in the early part of the year 1841 or just 40 years ago, as the first Principal of the first Collegiate Institution in Madras, having been selected for the office by Mr. Mountstuart Elphinstone who had been Governor of Bombay, and who had been applied to, on behalf of the Madras Government, to engage a competent Head Master for the High School then about to be established by Lord Elphinstone's Government, Sir, in referring to the year 1841, I go back to a period when there was not one Government school in the entire Presidency deserving the name, when a grant of fifty thousand Rupees, obtained from the Court of Directors by Sir Thomas Munro, formed the sum total of the State endowment for purposes of public instruction throughout Southern India, when Government were deeply impressed with, and deplored the utter absence of educated natives to fill even the humblest offices in the Uncovenanted Civil Service, when, in short, as was truly said at the time, general ignorance darkened the face of the land. Such was the time when Lord Elphinstone laid the foundation of the present system of Native Education in this Presidency. His educational measures were based upon two cardinal principles, 1st, that the intellectual and moral elevation of a people was best secured by commencing with the education of the higher classes or those possessing leisure and influence over the minds of their fellow-countrymen; and 2nd, that Government should observe perfect neutrality in the matter of religious instruction. It was this higher education of the natives on a secular basis, which that early champion of liberal education, Mr. George Norton, and, after him, his successor and namesake Mr. John Bruce Norton fought for in those days, which Mr. Powell was called upon at that early period to give effect to, which was subsequently shaped with so much success by the first Director of Public Instruction, Sir Alexander Arbuthnot and which is still exercising the minds of not a few—some denouncing it as godless, others as a source of political danger. Mr. Powell applied himself to the task set before him with singular devotion and earnestness. For twenty long years, he labored zealously and incessantly amidst difficulties and discouragements, and through evil and good report. It is not for me, your Grace, to say how far he succeeded in his labors, how he succeeded in stamping the mark of his own mind on his pupils, how he instilled his own excellent principles into those successively brought within the influence of his teaching and example, how, in particular, he fulfilled the more immediate object, set before him, of raising up a class of men fitted by their character and acquirements for employment in the civil administration of the country. Suffice it for me to say that Mr. Powell's success as a School master was rewarded in the first instance by his being placed by Sir Charles Trevelyan's Government, at the head of that Department which his own labors had, in no small degree, contributed to create, and in the next place by his admission to the Companionship of the most honorable Order of the Star of India, by a generous and appreciating sovereign. Sir, grateful as we are to Government, grateful as

we are to all those good and earnest workers in the field of education, who have contributed by their labors to the moral and intellectual advancement of this Presidency during the last forty years, I feel—the Natives feel that, throughout that long list of distinguished names, no name is more entitled to the gratitude and esteem of the people of this Presidency than the name of Eyre Burton Powell.

His Grace the Governor then addressing Mr. Ramiengar spoke to the following effect. It gave His Grace very great satisfaction to comply with the request to unveil the statue of one whom Mr. Ramiengar had truly described as the leader of education in Madras. His Grace had no idea that the statue was such a finished piece of art as it undoubtedly was. Personally he had not had the pleasure of knowing Mr. Powell, but from what he had heard and read of him, His Grace felt sure that his name would be handed down to posterity as one of the most believed of leaders of education in Southern India.

The statue was then unveiled and, for some minutes, the eyes of all present rested upon the work of art which, in speaking terms, recalled to the memory of those who had seen him the commanding figure of Eyre Burton Powell.

After due time had been allowed for the inspection of the statue, the Hon'ble V. Ramiengar, C.S.I., on behalf of the members of the Powell Memorial Committee, thanked His Grace for kindly presiding and unveiling the statue, and the ladies and gentlemen assembled for their great kindness in readily responding to the invitation of the Committee to be present on the occasion.

The following notice of Mr. Powell's Indian career appears in Messrs. Higginbotham and Co's interesting publication, *New Whos Indian* (Supplement):—

Powell, E. B., C.S.I., late Director of Public Instruction, Madras Presidency. Mr. Powell commenced his career as an Educationist in the year 1841, as Principal of the then High School, afterwards raised to the status of a College. He took an active part in the establishment of the Madras University, and, as the head of the leading Educational Institution in the Presidency, did incalculable good in the cause of Native education. Many distinguished Native gentlemen of the day, among others Sir T. Madava Row, K.C.S.I., the Prime Minister, successively of Travancore, Indore and Baroda, Mr. A. Sashia Shastri, C.S.I., ex-Dewan of Travancore, Mr. Runga Charlu, C.I.E., the Controller of the Rajah of Mysore's Palace, and the Hon'ble V. Ramiengar, C.S.I., were his pupils; and when Mr. Powell retired from his office in 1875, he received the most pleasing tokens of the gratitude of the Native community at large. Mr. Runga Charlu, speaking at a public meeting of the services rendered by Mr. Powell to native education, wound up an eloquent speech as follows:—"If one were asked in what respect the India of to-day differs from what it was thirty-five years ago, the answer would be, in the immense progress which education has made; and with this progress Mr. Powell's name must for ever be inseparably connected, although other distinguished men rendered no small service in the same field and earned our gratitude in no small degree. There were other great men whose past services in connection with Native education, I need not mention, and others again who are just taking the place of those who have retired from the field, giving us thus assurance that the intellectual advancement of our people will never be without

its liberal and willing advocates. But in the gallery of all these great men to whom the country owes its gratitude in an eminent degree Mr. Powell must occupy the central figure as the first, the longest and the most zealous labourer in the field, and in doing honor to him, we may feel assured that we honor all the great men who battled by his side for our interests." As a mark of the esteem in which Mr. Powell was held by the educated portion of the Native community of Madras, they have, by raising a handsome subscription amongst themselves, perpetuated his memory by the erection of a marble statue which has been appropriately placed in the new Presidency College, a noble specimen of Mr. Chisholm's architectural skill, of which Madras is justly proud. This statue which is the work of the eminent English sculptor, Mr. Adam Acton, and a most faithful likeness of the original, will form an affectionate tribute, that will interest to future generations of Indian students, the gratitude cherished by their predecessors for one who devoted the best years of his life, with earnestness and singleness of purpose, to the moral and intellectual elevation of the Native youths of the Madras Presidency.—*Madras Times.*

APPOINTMENTS.

Appointments made by the Director of Public Instruction, between the 15th February and 15th April 1880.

C. R. Doraisamy Iyer, B.A., to be 5th Master, Cuddalore College, on Rs. 60 rising to Rs. 80.

N. Venkoba Row, B.A., to be 5th Master, Salem College, on Rs. 60 rising to Rs. 80.

Mr. Joseph, B.A., Deputy Inspector *substantive pro tem*, Tellicherry, to be Assistant Master, High School, Tellicherry, on Rs. 80.

T. Matthai, to be Deputy Inspector *substantive pro tem*, Tellicherry.

B. Sesha Iyengar, to be Head Master, Government Middle School, Kulitalai, Rs. 40.

S. Krishnaswamy Iyer, to be 2nd Master, Kulitalai, on Rs. 30.

V. Swaminatha Iyer, to be 1st Tamil Pandit *substantive pro tem*, Combaconum College, Rs. 50.

A. Subba Row, B.A., 2nd Master, Cannanore High School, to act as Deputy Inspector, Tellicherry, on Rs. 80.

K. V. Subbarayudu, Head Master, Government Middle School, Bimlipatam, to be Head Master, Amalapore, on Rs. 40.

B. Ramamurti, to be Head Master Middle School, Ankapally, on Rs. 40 *vice* G. V. Subba Row.

M. Narasimha Row, Pamulu, 1st Assistant Master Middle School, Ankapally, to act as Head Master, on Rs. 40.

T. Sreenivasa Chetty, to be Deputy Inspector of Schools, Masulipatam Circle, on Rs. 100.

B. Raghavendra Row, to be Head Master Normal School, Mangalore, on Rs. 80.

T. V. Vaithianatha Iyer, 4th Assistant High School, Tellicherry, to be 3rd Assistant *substantive pro tem*, *vice* Mr. Lemerle.

A. Anantakrishnayya, 5th Assistant, High School, Tellicherry, to be 1st Assistant *substantive pro tem*, High School, Cannanore, on Rs. 45 *vice* A. Subba Row.

Mr. Burroughs, B.A.,L.L.B., to act as Head Master Saidapet High School.

Mr. Messinger, to act as Head Master, Chittoor High School.

Mr. Sesingiri Prabhu, 1st Assistant Middle School, Badagari, to act as 4th Assistant, High School, Tellicherry.

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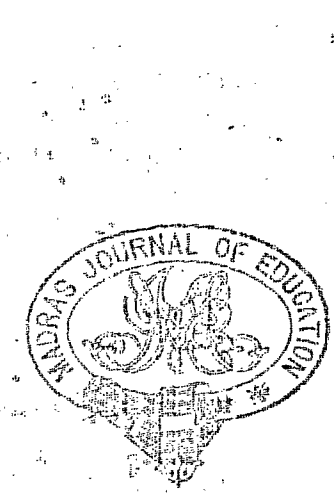

VOL. XXII. No. 4. APRIL 1880. Published Monthly.

THE MONTH.

The long expected "*Introductory Primer*" in Macmillan's series, by Professor Huxley is at length published. It will be of great use to teachers who wish to give their pupils correct elementary notions in Physics and Chemistry when commencing the study of the Physics and the Chemistry Primers. There is a wealth of illustration in Professor Huxley's little work, and it is a model for Teachers who desire to interest their pupils in these studies. The first section of the book treats of the relations that must exist between NATURE AND TRUE SCIENCE. The second section is on MATERIAL OBJECTS, and treats of (1) *Mineral Bodies* (among which some of our less scientific readers may be surprised to find *Water* is included) and of (2) *Living Bodies*, Vegetable and Animal. The third section on IMMATERIAL OBJECTS speaks very briefly indeed of *Mental Phenomena*, and explains what is meant by the term *Psychology*.

Every Teacher of Science should at once order a copy of this little work.

Mrs. BRANDER, lately Superintendent of the Government Female Normal School, has been appointed Inspectress of Schools for the Madras Presidency. When this lady retired from the service shortly before her marriage, the Madras Government paid her the high compliment of officially

noticing and thanking her for her good services in connection with the Normal School; and the present appointment has we understand been conferred upon her by the Secretary of State at the request of the Madras Government, and unsolicited by her. The appointment we presume will practically be that of Directress of Female Instruction, so that henceforth there will be both a King and a Queen on the throne of Beentford.

THE Degree of Doctor of Science has been conferred by the University of Edinburgh on Mr. David Duncan, Professor of Mental Philosophy at our Presidency College. The Degree is given in recognition of Mr. Duncan's literary work in conjunction with Mr. Herbert Spencer, and of a treatise that he has recently published on the Psychology of the Upanishads. Mr. Duncan has applied his recently acquired knowledge of Sanskrit to an investigation profoundly interesting to European philosophers.

THE attention of the Head-masters of Schools is directed to the following change in the subjects for the Matriculation Examination. The change will come into operation in December, 1881.

Instead of Professor Geikie's Physical Geography, Candidates are required to study Professor Roscoe's Chemistry Primer, to the end of Article 52.

The paper in General Geography will be given on the fifth day from 10—12, and the paper in Physics and Chemistry on the same day from 2—5; thirty marks being awarded to the former paper, and fifty to the latter.

Also at the F. A. Examination, 70 marks instead of 50 will be awarded to Physiology. This change will come into operation in December, 1880.

NEW EFFECT CERTIFICATES.—Under rule 22 of the Educational Grant-in-aid Code the maximum grant in the case of teachers passing in but one language is only 75 per cent., of the sum specified, except in the lowest grade, in which only one language is prescribed.

It has been pointed out that this rule may be so construed as to reduce the grant of a teacher on passing for a higher grade with an imperfect certificate.

Thus a certificated schoolmistress of the 3rd grade may be drawing a salary of Rupees 24, of which half is a Government grant. If she passes for an imperfect certificate of the second grade and no change is made in her salary, it may be said that strictly speaking

she is entitled to a grant of only Rupees 9; and that the Manager of the school should pay her Rupees 15 instead of Rupees 12.

In all cases of this nature the Manager will be allowed the option of claiming the grant due under the lower certificate, provided the maximum which can be so claimed is not exceeded.

EXAMINERS' REPORTS.

WE extract from the twenty-fourth annual Report of the Syndicate of the Madras University recently published, the following Reports made by the Examiners at the late Matriculation Examination. We would suggest that in the interests of Education generally, a copy of this Report should be furnished by the Registrar as soon as it is published, not merely to the Fellows of the University, but also to the public Journals and to the Head-master of every High School, and College. Although the Report has been published for some weeks, we have as yet received no copy except the one now before us, for which we are indebted to the special courtesy of a Fellow of the University. If the Report is not widely circulated with as little delay as possible, the object of the Syndicate in publishing it will be defeated. We commend the following remarks of the Examiners to students of the present year, and we hope that during the six months' time for study still before them, they will be able to profit by the suggestions that the Examiners have taken the trouble to make for their advantage:—

Mr. E. P. METCALFE in his report says, "My portion of the paper was fairly well done on the whole, the handwriting was generally good, but the spelling was often unsatisfactory especially in the case of common grammatical terms such as "Nominative," "Transitive," "Apostrophe," "Vowel" and the word "irregular." It is to be regretted that boys do not make a point of mastering the Orthography of such common words, seeing how much a paper is disfigured by errors of that kind. I endeavoured to make the paper as sound as possible bearing chiefly on leading principles. From what I have seen, I am inclined to think that sufficient attention is not paid to the rules and their application. The two sentences, for instance, "Alexander was an ablest General" and "Many were the candidates failed in the Examination" were pronounced to be correct by a very large majority. This neglect of the application of grammatical rules probably accounts for there being so few boys who can work out the meaning of an English passage if left to their own resources having only Grammar and Dictionary to aid them.

Mr. A. MONRO remarks, "only one of the Matriculation candidates sent up a decent piece of Latin Prose. The other attempts were free from errors of grammar, were bald and unidiomatic. The most noticeable feature, however, of the Matriculation papers, was the

disparity between the translation and grammar. The translations were in most cases distinctly good, and as a general rule fair, but the grammar was on the whole a failure. Few of the candidates appear to have been taught the difference between direct and indirect narration. The majority of the failed candidates were ignorant of the formal parts of Etymology, but what is worse, were unable to parse a simple sentence correctly. The crucial test was the pieces set for parsing and explanation in which the ignorance of many of them betrayed itself most conspicuously. To take an instance. In the passage from Virgil Aeneidos, Book V, 713, 714 set for parsing and explanation.

"Huic tradi, amissis superant qui navibus, et quos
Pertaesum magni incepti rerumque tuarum est."

Numbers of the candidates translated the passage quite *correctly*, but gave such answers as *quos* accusative case governed by *tradi*;" Pertaesum "an adjective" "an adverb" "a supine." The obvious inference from this is that these candidates had been "crammed" in their text-books, without any attempt having been made to teach them the grammar and construction of the portions they read, and that their translations were mere parrot-like efforts of memory. Such a system of teaching is radically unsound and it is needless to remark that the time which students taught on this principle devote to the study of Latin is simply wasted. The slight and imperfect acquaintance they [illegible] with the language will probably be forgotten as soon as they leave [illegible] * * * "The best papers were from Tanjore and Negapatam; the Negapatam candidates were perhaps the better of the two, being not so liable to the charge of *neglect* of grammar. Many of the failed candidates from this place, failed mainly through an imperfect knowledge of English, and a consequent inability to express themselves in that language, but the instruction at Negapatam appears to be thoroughly good, as even the worst candidates showed evidence of having been taught with considerable care.

The Greek candidate failed in every subject."

Mr. P. Vijayaranga Mudaliyar remarks of the Tamil papers examined by him as follows:—

"The translation from English into Tamil executed by the Matriculation candidates was generally very fair. The Tamil composition was generally very poor. The following was the subject:

"Oh what a tangled web we weave
When first we practise to deceive."

Very few understood the meaning of the lines correctly. Some described a cobweb;" some a silkworm and its cocoon, and not a few the manufacture of cloth."

Mr. P. Srinivasa Row, one of the Examiners in Telugu says, "Almost all the candidates acquitted themselves well in translating the prose passages, but totally failed in translating the verses. They seem to know the meaning of words but not the import of the tanza. This is *partly* due to the pernicious mode of teaching, adopted by Pundits and Munshies who are mostly of opinion that their duty consists in giving synonyms for all the words in the tanza (word for word meaning) and in teaching the rules of grammar apart from the text-books, never trying to find out whether the boys know the subject matter and the application of the rules of grammar; and it is *greatly* due to the indifference and negligence on the part of the students who are foolishly inclined to think that they can *safely depend* upon translation alone for the minimum marks required.

As for composition, the majority of candidates could not make out the meaning of the first line of the couplet.

"Oh what a tangled web we weave
When first we practise to deceive."

A great number of candidates inferred from this that "he that begins to deceive others must be as cunning in spreading his snare, as the spider in weaving a web to catch flies." Some candidates wrote an essay on the art of weaving, dwelling long upon the manner in which weavers deceive the people, and others wrote two Essays, one on the art of weaving and the other on deceiving. One candidate sent in an English Essay on weaving and a few did not attempt the Essay at all. Out of about 700 Telugu candidates hardly a dozen understood the true subject of the Essay. I therefore propose that the subject for composition be given in the vernacular of the candidates."

(The remaining Reports on the First Arts and B.A. Examinations we must hold over till next month.)

COLERIDGE'S ANCIENT MARINER.

THERE are three readers of the Ancient Mariner." The first is gross enough to enjoy all the imagery of the Mariner's visions delivered by the poet for actual *facts* of experience; which being impossible, the whole pulverises, for that reader, into a baseless fairy tale. The second reader is wiser than *that*, he knows that the imagery is the imagery of febrile delirium; really seen, but not seen as an external reality. The Mariner had caught the pestilential fever, which carried off all his mates; he only had survived—the delirium had vanished; but the visions that had haunted the delirium remained. "Yes," says the third reader, "they remained: naturally they did, being scorched by fever into his brain; but how did they happen to remain on his belief as gospel truths? The delirium had vanished: why had not the painted scenery of the delirium vanished, except as visionary memorials of a sorrow that was cancelled? Why was it that craziness settled upon this Mariner's brain, driving him, as if he were a Cain or another wandering Jew, to 'pass like night from land to land;' and, at certain intervals, wrenching him until he made rehearsal of his errors, even at the difficult cost of holding children from their play, and old men from the chimney corner? That craziness, as the *third* reader deciphers, rose out of a deeper soil than any *bodily* affection. It had its root in penitential sorrow. Oh, bitter is the sorrow to a conscientious heart, when, too late, it discovers the depth of a love that has been trampled underfoot! This Mariner had slain the creature, that, on all the earth, loved him best. In the darkness of his cruel superstition he had done it, to save his human brothers from a fancied inconvenience; and yet, by that very act of cruelty, he had himself called destruction upon their heads. The Nemesis that followed, punished *him* through *them*—him that wronged through

those that wrongfully he sought to benefit. That spirit who watches over the sanctities of love is a strong angel—is a jealous angel; and this angel it was

"That lofet the bird that loved the man
That shot him with his bow."

He it was that followed the cruel archer into silent and slumbering seas:—

"Nine fathom deep he had followed him,
Through the realms of mist and snow."

This jealous angel it was that pursued the man into noon-day darkness, and the vision of dying oceans, into delirium, and finally (when recovered from disease), into an unsettled mind.

"Mr. Barrow who has just issued the excellent annotated edition of the *Ancient Mariner* that we have noticed elsewhere, sends us the above extract from De Quincey. It will be noted in his *Spanish Military Nights*—a curious place for such a piece of detailed criticism.]

VACCINATION OF PUPILS IN SCHOOLS.

Colonel R. M. Macdonald, Director of Public Instruction, writes as follows to the Acting Chief Secretary to Government, under date Madras, 2nd October 1879:

I have the honor, with reference to G. O., No. 769, of the 22nd April 1879, to submit the result of my inquiries into the question of making vaccination in schools compulsory.

Mr. Thompson, Principal of the Presidency College, states that all but a very small proportion of the students attending that institution are shown by the annual returns to have either been vaccinated or to have had the small-pox. He is of opinion that there would be no difficulty in making vaccination compulsory.

Mr. Gopal Row, Principal of the Kumbakonam College, shows that the proportion of unprotected students is small and decreasing. He considers, however, that compulsory vaccination is impolitic as well as objectionable in principle.

Mr. Metcalfe, Principal of the Rajahmundry College, would make vaccination compulsory in Government and aided schools. He always makes a point of urging all to undergo the operation who are pronounced unprotected by the Medical Officer at his annual inspections, and states that on the last occasion all who required it were vaccinated.

Mr. James Bradshaw, Acting Inspector of Schools, First Division, is not on the whole in favor of making vaccination compulsory. He thinks, however, that the Local Fund Boards and Municipalities might bring pressure to bear in this direction on results schools under Rule 27, and that the privilege of attending Local Fund Schools without paying any fee, which exists in the Cocanada Circle, might be restricted with a view of enforcing or encouraging vaccination.

Mr. Fortey, Inspector of Schools, Second Division, considers that vaccination may be made compulsory in Government and aided

schools. Mr. Fowler, Inspector of Schools, Presidency Division and Mr. Garthwaite, Inspector of Schools, Sixth Division, hold the same view.

Dr. John Bradshaw, Inspector of Schools, Fourth Division, would make vaccination compulsory in all schools in which English is taught. He encloses letters from his Deputy Inspectors, some of whom state their objections to vaccination being made compulsory in village schools and Government girls' schools. He quotes with approval a suggestion that the Superintendent of Vaccination should in his tours visit each Government school and satisfy himself by personal examination as to the correctness of the entries relating to vaccination in the registers, and another that appointments should be given only to those who are vaccinated.

Mr. Marden, Inspector of the Fifth Division, thinks that for the present it will be sufficient that all boys should be vaccinated before admission into a Government, Local Fund or Municipal School. The rule might be extended to aided schools at some future period.

I recommend that vaccination be made compulsory—

(i) In all Government and aided schools of every grade in the town of Madras.

(ii) In all Government and aided schools in the Mofussil in which English is taught.

I would leave it to the Local Fund Boards and Municipalities to decide whether vaccination should be compulsory in all or any of the vernacular schools under their control or aided by them.

From Surgeon-Major W. R. Cornish, F.R.C.S., Sanitary Commissioner for Madras, to the Chief Secretary to Government, dated 23rd February 1880, No. 92.

With reference to letter, No. 4360, of 2nd October 1879, from the Director of Public Instruction, I have the honor to state that the measures recommended by that officer for the encouragement of vaccination in schools are generally approved of.

I think, however, that the orders of Government as expressed in G. O., No. 2019, of 28th October 1879, Financial Department, with reference to the Chingleput and Saidapet Local Fund Boards, should be extended to all other Local Fund Circles and Municipalities. Practically it is found that unprotected children are not numerically great in Government schools, but they are numerous in Local Fund, Municipal, and private schools, and it would be advisable to enable the local authorities to demand the vaccination of unprotected children admitted into them.

From the commencement of the current year, I have directed the Deputy Inspectors of Vaccination to examine and report on the condition of pupils in all Government and aided schools in the towns and villages visited by them, and these orders are now being carried out.

Order thereon.—Until vaccination is made compulsory, Government cannot go as far as the Director of Public Instruction suggests. But Government wish that vaccination be made a condition precedent for holding a Government scholarship or stipend or free scholarship, and that it be required of all students in Government schools.

It is not fair that vaccinated students should be exposed to risk

(protected more or less though they be) by the admission of unvaccinated fellow-students.

As regards Local Funds and Municipal schools, the Proceedings of Government, dated 28th October 1879, No. 2049, will be communicated to all Local Fund Boards and Municipalities.

LOCAL FUNDS—EDUCATION AND VACCINATION.

Read the following paper :—

No. 93. Proceedings of the Board of Revenue, dated 13th August 1879, No. 2307.

ABSTRACT.—Submitting to Government Board's views on proposal of the President of the Saidapet and Chingleput Local Fund Boards and of the Conjeeveram Municipality to add to the Result Grant Rules a clause declaring that no grant should be paid for any child who is not certified, on inspection by a Local Fund Vaccinator, to have either been successfully vaccinated or to have had small-pox.

ORDER THEREON.—His Grace the Governor in Council fully approves the proposal of the Chingleput and Saidapet Local Fund Boards, and endorses the opinions expressed by the Board of Revenue, subject to any decision which may hereafter be arrived at in regard to the proposed legislation for regulating vaccination.

SCHOOL OF AGRICULTURE.

THE Summer Session of the School of Agriculture began on the 1st April, on which date there were 27 agricultural students and 24 normal students on the rolls. The session closed on the 30th June. The Winter Session began in September, but although the classes assembled in that month the lectures and class-room instruction commenced at the beginning of October, when 33 new students were entertained under G. O., No. 1,348, of the 22nd August 1878. The session closed on the 31st March with 57 agricultural students on the rolls, of whom 30 belonged to the new class. Besides these men 20 students of the normal school attended a special course of lectures. The marks obtained by each student at the weekly and sessional examinations, the questions set at these examinations, and extracts from the remarks made by the various lecturers on the progress and conduct of the classes are given in the report. All the lecturers speak in terms of commendation of the industry and good conduct of the students. In the 2nd Class 17 students were eligible at the end of the Winter Session for first-class certificates and 5 to second-class certificates. The standard has been raised for the new 1st Class, and at present 18 of them are so far eligible for first class certificates and 12 for second-class certificates. The gymnastic training to which the students have been subjected has been attended with considerable success. In the Summer Session 24 normal students attended twelve agricultural lectures, three field classes, and one examination. The marks obtained by them ranged from 28 to 86 out of a hundred. In the Winter Session 20 normal students attended a special course of lectures, delivered by Mr. Benson. There were eleven lectures, of which seven were delivered at the Normal school and four at Saidapet, and four field classes. The marks obtained by the students ranged from 31 to 86 out of a hundred. The report does not show how many of the 30 new students

are undergraduates and how many are persons who have passed inferior examinations, but past experience shows that it is not desirable to admit men of the latter class if it can be avoided. It seems very desirable that steps should be taken at an early date for establishing agricultural classes in connection with some of our mofussil Colleges and High Schools and for utilising as teachers some of the young men who have gone through the agricultural curriculum. The arrangements adopted in the Bombay Presidency seem on the whole suitable to this Presidency. The subject was discussed by Mr. Robertson and the Director of Public Instruction and it was decided to submit a detailed scheme for the consideration of the Board of Revenue. The Government passed the following order on the report on the 9th August last :—The foregoing report on the School of Agriculture deals with the third or final year's training of the class first formed and with the first six months' work of that entertained in September last. It appears that 22 students have now passed out of the College after completing a course of instruction, and that 17 of these succeeded in qualifying for first-class certificates. These results may be considered satisfactory, and His Grace the Governor in Council is glad to note that Mr. Robertson considers that the fresh class "promises to be a very good one." Besides the regular students of the school 24 young men from the normal school received instruction both in the lecture room and field during the Summer Session, and 20 in the Winter Session. The progress made by these students was good considering the disadvantages they labored under in having but a limited acquaintance with operations on the farm. Their attendance there should be facilitated and encouraged. In regard to the Director's suggestion for the establishment of agricultural classes in connection with some of the Colleges and High Schools throughout the country, the Government observe that the number of persons qualified to carry out the necessary course of instruction without supervision must as yet be very limited, but they will be prepared to consider any well-matured scheme that has a fair promise of success.

THE GOVERNOR'S ADDRESS AT THE CONVOCATION.

THE following abstract of the address of His Grace, the Chancellor, at the convocation of the Madras University, would have appeared in our issue of yesterday, had we not hoped to have been able to give the speech *in extenso*. His Grace began by considering the past and present systems of education and the influence exercised over such education by the Madras University. To such persons as the candidates before him the University would hereafter have to look for guide and counsel. Therefore it was a serious question to consider whether the system of education now being pursued was such as was likely to produce men who would be of service in rightly directing the affairs of the University. Whatever might be the opinion of persons who had greater experience than he possessed in such matters and who also had a more intimate acquaintance with the natives of the country than he did, he had no doubt that he could answer the question in the affirmative. There might be found men trained under the present system of education who might be deemed very superficial, who by their style of writing showed that

they have but a surface knowledge. Yet, there were numbers of persons of sound and solid education who, having been well taught, were doing honor to the institutions in which they were educated, and to the University which conferred degrees on them. There could be no doubt that the University exercised a most powerful and beneficial influence on education, and that influence was not only indirect but also, to a certain extent, direct, for by a careful attention to the tests to be passed by the candidates the examinations could be made fruitful of much good. Further it was not only upon the tests, but also upon the ability of the examiners, and no less upon the rules prescribed by the senate and the ability of the professorial teaching that the influence exercised by the University depended. It was, therefore, very necessary that great care should be taken in the selection of examiners for the University tests, in the framing of the rules, and in the fixing of the standards of the tests, for if the standards are allowed to fluctuate the objects of University education must be interfered with. His Grace next proceeded to consider the prospects of the graduates who had just taken their degrees. In dealing with this question, His Grace alluded to the several faculties, pointing out the attractions, advantages and peculiar claims of each on the attention of studious youth. In arts, throughout the presidency, there were a number of members who had taken their degrees and were exercising a wide-spread influence. It was from men of this class, he thought, they should gather members to their councils, men who, by their education, were well fitted to advise and advance the interests of the people of Southern India. These men had the advantage of gaining a knowledge of the political and social history of other and more advanced countries than that of India, and that knowledge ought to make them to form correct notions as to a right form of Government, based on liberal and generous ideas. In the faculty of law, the numbers were growing rapidly enough, and some even thought that they were growing more rapidly than was desirable, but there were posts within the reach of the student of law which are held out as the rewards of diligent study, strict integrity, and marked ability. And to these posts the graduates in law of the Madras University might well aspire. In medicine, the services of good men were at all times needed. His Grace considered it a good sign since his arrival in this country that there should have been such a large increase to the number of hospitals and dispensaries, and that the request for the establishment of these institutions came from the people themselves. There were at present throughout the Presidency, 170 hospitals and dispensaries. With such an increase in the number of these institutions, there must necessarily be an increased demand for men properly trained in medicine. Additional medical officers are being constantly required, so that the graduates in medicine had before them a wide field for usefulness. As to the faculty of engineering, His Grace, when he came to this country, was very much surprised to find so few attracted to it. The character, the climate, and the requirements of the country were such as to make engineering knowledge very essential. He thought that it would have been the first care of the people of the country to take steps to acquire a knowledge of how best to economise and utilize that one essential element, water. This country opens out a field for engineers hardly

elsewhere to be found in the world. The science of irrigation should have been almost a monopoly of the people of a country situated as India is; but it was otherwise. His Grace passed on to notice the want of interest shown by natives in architecture and to their dependence on the European architects for the designs of their buildings. But he had hopes that the time would come when the natives would undertake such work for themselves, preparing their own designs, not only for their palaces but for buildings of a humbler kind. This lack of interest is more remarkable, as all over the country there are monuments of architectural skill, testifying to the fact that in this branch of art the people of India are capable of excelling. He alluded to the pagodas of Chellumbram, of Villinoor in the centre of Pondicherry, and other monuments of architecture to be found scattered throughout Southern India, affording the most certain proof of the excellence attained in the art by those who constructed them. His Grace next went on to notice the recent changes that had taken place in connection with appointments in the Public Works Department, and to the opening for engineers in Local Fund Boards and Municipalities. His Grace dwelt strongly on the necessity of engineering students working, not for themselves a career of usefulness and distinction out of the service of the Government, for it was such engineers as by their own exertions gave proof of any special ability that were looked to for assistance even by the Government when any great work was to be undertaken. Here in Madras was the Harbour, which had now reached a point from which it might be hoped that success would attend it, and which when completed would immensely increase the importance of the city, give a safe anchorage to ships and develop the trading interests not only of Madras but also the general commercial prosperity of a large part of the Presidency. For such work the Government did not look to their own officers, but to one who had given proof of special ability in the construction of similar works in other parts of the world. His Grace showed how that, even in other countries, special engineering skill was utilised by the Government when that skill was discovered among engineers with no official connection with the State. Holland and France, it was known, had largely employed English engineers because they were known to have special knowledge of the works required to be constructed. The latter part of His Grace's address was devoted to a consideration of the duties the graduates owed to the University, to society, and to the State. To the University which fostered them, he said, the newly made graduates owed a great duty. From them would, in future, be taken the members of the Senate, and to them, perhaps would be entrusted the guidance of all University matters. It therefore behoved them by their lives and their conduct to protect and advance the interests of the University. To society and to the State, the graduates owed it that they should make the best use of the knowledge which they had acquired by the means of a University education. In every department of life they might make their lives useful to their fellowmen and to the State. As doctors, lawyers, engineers, they will have full scope for the highest kind of usefulness. His Grace, in connection with this part of his subject, paid a well-deserved complement to the able services rendered by Mr. Runganatha Sastri to the Government, and added that he would have in a few

days the pleasure of appointing that gentleman to a seat in the Legislative Council.

The address was listened to with very great attention, and was most enthusiastically applauded at its termination.—*Madras Times.*

THE PRESIDENCY COLLEGE ANNIVERSARY.

THE anniversary of the Presidency College, was held April 24th, in the Hall of the Old College at Chepauk. The Hon'ble Sir Charles Turner, C.I.E., presided, and there was a crowded attendance of the friends of the institution.

Colonel Macdonald, the Director of Public Instruction, addressed the meeting as follows:—

Mr. CHAIRMAN, LADIES and GENTLEMEN:—In accordance with the usual custom, I propose with your permission making a few remarks on some points connected with the report which will be read presently by the Principal. I believe I may say that, taken as a whole, the institution has perhaps never been in a more flourishing condition than it is now. From time to time in past years the attendance has been liable to be affected by the raising of the standard in other institutions both at Madras and in the Provinces. The Presidency College was once almost the only College in this Presidency. It is now only one among many, and each year sees an increase in the number and efficiency of those rival institutions. The most important of those recent additions is, perhaps, Patcheappa's College, which, although affiliated as yet only up to the First Arts standard, will probably, at no very distant date, grow into a great Hindu College of the first grade. The S. P. G. College at Tanjore, which ranked last year as a second grade College, now prepares students for the B. A. degree. The Sawyerpuram Seminary, in Tinnevelly, has also been affiliated up to the F. A. standard, and a First Arts Class was opened a few weeks ago in the Madura High School. Notwithstanding, however, the development of these institutions and the growth of others which were raised to the rank of colleges a year or the year before, it is satisfactory to find that the strength of the classes here has increased instead of diminishing. On an average there are 60 students in each of the four college classes, and it is unnecessary to say that even the most energetic Professor can scarcely wish to have much larger classes than those. The average strength of the six classes in the High and Middle Schools is 34, and such classes are about sufficient for most teachers. The College has been very successful in the B. A., F. A., and Matriculation, about two-thirds of those who went up having passed, and several of those who passed having stood very high in the lists. This high average is partly due to the character of the examination held this year. It has often happened that there have been great fluctuations in the standard of the examinations, but certain measures were adopted last year by the Syndicate to check this evil, and the result has been that there have been fewer complaints than as usual on this score. Mr. Thompson refers in his report to the institution of a new public examination styled the middle-school examination, on which I may take advantage of this opportunity to make a few remarks. Some years ago, a Committee was appointed by the Government of India to revise the statistical forms of returns relating to education, and one of the measures recommended by this Committee was that all schools should be classed according to certain standards, as high, middle, upper primary and lower primary, and that certain examinations, styled the middle-school, the upper primary and the lower primary school examinations, should be instituted throughout India. It was considered that if it were made a rule that no pupil should be admitted into a high school, who had not passed the middle-school examination, or into an upper primary school who had not passed the lower primary school examination, statistics based on this classification would be more generally intelligible than if they were left to depend on standards varying according to the systems pursued in each Presidency. This report was referred to the local Government and final orders were issued on it at the beginning of last year. These orders, which directed the institution of a middle-school, an upper primary school and a lower primary school examination in every province, were immediately communicated to the heads and managers of schools, who must therefore have anticipated that these examinations would soon come into force. A good deal has been said and written about the evil of multiplying examinations, but, as I have explained the institution of these examinations was not an optional matter, and I think, that it can be shown that this measure has been carried out in such a way that there has been a decrease instead of an increase of examinations. In the first place, the middle-school examination has taken the place of the examination hitherto known as the General Test for the Uncovenanted Civil Service. This was divided into three branches, styled the English, the Anglo-Vernacular and the Vernacular, so that there were practically three different kinds of examinations, and the candidates coming up for these examinations were numbered by thousands. The middle-school examination has also, as a test of general education, superseded two other public examinations, viz., The 4th Grade examination for schoolmasters' certificates, and the 2nd Grade examination for the schoolmistresses' certificates. The middle-school examination will also in future render unnecessary the examination hitherto known as the comparative examination of the upper fourth classes of Government schools, to which a few aided schools were admitted. The object of this examination was to regulate promotion from the upper fourth class to the fifth class, which is precisely the main object of the middle-school examination. In schools in which the comparative examination was held, the Inspector was not required to examine the upper fourth class, but in aided schools, with the few exceptions above referred to, he had to do this. The Inspector's examination was not intended to regulate promotion, because it was impossible that he would examine every school at the time at which promotions are made, but it is to be presumed that in every aided school, there was an examination conducted by the masters themselves, on the result of which pupils were promoted from the middle-school. This examination will in future not be required. I think, I may, therefore, say that the middle-school examination has swept away eight different kinds of examinations, which have been hitherto in force. The same object has been kept in view in the regulations framed for the Upper and Lower Primary school examinations. As these are intended to test the progress of pupils of about ten and eleven, they must necessarily

be mainly *viva voce*. In primary schools, connected with colleges, high schools and middle schools, this examination is left to be conducted by the head of the institution or by competent assistants appointed by him, and uniformity of standard has been ensured, as far as it can be in this way, by prescribing the subjects and assigning the marks required for a pass. It cannot, I think, be said the examinations have been multiplied in this way, for these Upper and Lower Primary school examinations are merely slight modifications of certain annual examinations, which must have been always held in every properly conducted school. As regards primary schools unconnected with institutions of a higher grade, it would have been scarcely safe to adopt the same system, and accordingly in these schools most of which are on the results system, the Inspectors and Deputy Inspectors are authorised to give certificates on the result of their ordinary annual inspections, so that in this case also no additional examination is held. These two lower examinations do not affect such an Institution as the Presidency College, as there is no Primary department attached to it. There is, however, a small Middle School, and this department of the Institution, was, of course affected by the middle-school examination. Owing to the delay which took place before the scheme of this examination was finally approved and sanctioned, the notification announcing it did not appear until October, and this left a very short time for special preparation. Very little preparation was really necessary, for the examination was in harmony on most points with the scheme of study usually pursued. No provision was, however, made in the scheme for Latin or Sanskrit. In Government schools a boy is not allowed to commence Sanskrit until he reaches the lower fourth class which usually implies that he has already devoted five years to the study of his vernacular language, and even in classes in which Sanskrit is studied, the vernacular is not entirely dropped, as the pupil is still required to go on doing translations into and from the Vernacular. It was ascertained that in the other Presidencies Latin and Sanskrit did not form a part of the middle-school examination. These languages were therefore not included in the test, but as several alternative subjects were prescribed, it was quite possible for a pupil to pass who knew no Vernacular language. The lower classes in which the study of the Vernacular is compulsory do not exist in the Presidency College, and as a great many pupils in the upper fourth class were learning Sanskrit, some apprehension was felt with regard to the result. As a matter of fact, however, every boy but one who was in bad health, passed, and nearly half the pupils were placed in the first class. The general result of this examination throughout the whole Presidency was also fairly satisfactory. I have not been able yet to get an accurate statement of the number of candidates examined, but I believe it was under 2,000. The number of candidates who passed was 1,058, and of these 197 were placed in the first class. The passes were, no doubt, somewhat easy, but it must be expected that the standard will be gradually raised, and if this is done judiciously, I feel sure that this examination will greatly strengthen the hands of the headmasters of schools, by preventing the premature promotion of boys; which has been hitherto such a serious obstacle to progress in many of our High Schools. At the request of several headmasters, Latin and Sanskrit have now been added to the list of

languages in which a pupil may be examined, and there is another change for which many of them are anxious, and which, I hope, will be carried out, *viz.*, the reduction of the examination fee. At present pupils in schools pay rupees five, and other persons rupees seven. These rates are in accordance with the scale of examination fees for the General Test examination, but the honoraria paid to examiners in connection with the General Test examination have always been very high, and it seems probable that an examination fee of rupees three, in the case of pupils will be found sufficient to cover the necessary expense of the examination.

Mr. E. Thompson, the Principal of the College, read the following report on the progress of the Institution for the year 1879-80:—

College Staff.—On the 8th April, Mr. Duncan proceeded to Europe on twenty months' furlough, and on the following day Mr. P. Ranganatha Mudaliyar, First Assistant, Kumbhakonam College, took up his acting appointment as Professor of Logic and Moral Philosophy. Mr. Shephard, Professor of Law, being employed on other duty, Mr. R. B. Michell, M.A., Barrister-at-Law, was appointed to act for him, and has delivered the lectures of the past and present Session. Mr. M. Seshayier Sastri, whose appointment as Superintendent of Vernacular studies was noticed in the last report, entered upon his duties on the 16th July. In the Junior Department S. Rungaswami Aiyangar, B.A., succeeded S. P. Sundaram, B.A., as 6th Master, substantive, *pro tem* on the 16th April. The Senior Tamil Pundit S. Raghavachariyar, after a long and valuable service of 31 years, having retired on the 1st August, his place was taken by the second Pundit, C. Rajagopala Pillai, and the vacancy thus created filled up by the appointment of J. Velayudha Mudaliyar on the 18th of the same month.

Numerical strength of the College.—The number on the rolls of the Senior Department has increased during the year from 163 to 182, but has not recovered the whole of the loss suffered in 1878-79. The weak Junior B. A. and F. A. Classes of that year have become weak Senior classes in the present, and we shall have to wait another year to realize my anticipation that the College would soon be fuller than ever. This is almost certain to be the case at the close of the current official year, unless some great disaster attend the Matriculation and First Arts Examinations of next December. The Junior Department has risen from 187 to 206, and the classes both of the High and Middle School are at the present moment quite as full as I wish to see them. The falling off in the Fifth Class noticed in last year's report has proved to be only temporary, a considerable number of boys having joined it this year from other schools after passing the Middle School Examination.

University Examinations.—I have never had the pleasure of recording such uniform success at the University Examinations as has attended the College during the past year. At each of the three examinations, two-thirds of the candidates who appeared succeeded in passing. Of our 31 new graduates, one P. Rajagopala Chari stood first in the First Class, and several others were high in the second, in the First Examination in Arts nine were placed in the First Class, while as for Matriculation, though only two found places in the First class it is a satisfaction to pass as many as 42 in the second.

Optional Subject at B. A. Examinations.—In former reports I have noticed at some length the manner in which our candidates of the newly formed Junior B. A. class select the optional subject required for that degree. For many successive years the students who have taken up Logic and Morals have greatly outnumbered those who selected Natural Philosophy and Physical Science put together. The present class is no exception to the general rule, but I am glad to observe that the number taking up Physical Science has risen from one to six. The greater difficulty of the papers set last January in Logic and Morals, especially in the latter, joined to the fact which became known before the end of February that the Physical Science candidates had gained exceptionally high marks, might have been expected to produce a reaction against Logic and Morals, but in this College at least this result has not occurred. It is not within the province of a report like this to discuss the changes in the Physical Science curriculum now under consideration by the University authorities, but I may at least be permitted to express my hope that these changes when made will tend to popularize studies, the importance of which is more widely recognized year by year, and to fill the Laboratory of the College with diligent enquirers into the secrets of Nature.

Middle School Examination.—The year that has just passed is marked by the institution of a new public examination in accordance with orders from the Government of India. The middle school examination intended to test the fitness of the pupils of the highest class of a middle school for promotion to a High School was held for the first time in January last; unfortunately the notice given of this new test was very short, and the master of our Upper Fourth Class, C. Bashyum Aiyengar, had less than two months at his disposal to prepare his pupils for it. He worked however with great energy, and to his exertions in no slight degree must be attributed the success of the class. The examination was no doubt easy, due allowance being made by the examiners for the shortness of the notice, but in any case it is a creditable thing to pass all but one out of 96, and even that one would certainly have passed had he not been suffering from the effects of fever. It is still more satisfactory to find that 44 per cent. of the successful candidates were placed in the first class, and that one stood third in a list of some eleven hundred names. There is, however, an aspect of the question which is not so satisfactory: the examination being an easy one, several boys passed from our class, whom in the ordinary course of things I should not have thought of promoting, and it is highly probable that of the successful candidates who have joined our Fifth class from other schools, many may be equally unfit: the presence of such boys must be detrimental to the progress of the class. This, it may be hoped, is only a temporary evil; the examination of next December will certainly be of a more searching nature, and its results will, therefore, be a safer test of fitness for promotion.

College Examination.—The classes of the College were examined by the Professors and Masters in November and December last; the results present no very striking feature, but, looking at them as a whole, I am inclined to fear that the present year will not prove as prosperous as the last so far as the Degree and First Arts Examinations are concerned. In the first College class especially the

averages obtained are far from satisfactory. In the Junior Department the most striking feature is the marked superiority of Division B to Division A in the Preparatory Matriculation class.

Law Class.—The Law Class has greatly increased in strength during the year under review. During the last Session of 1879, seventy-five students attended it, and in the present Session this number has risen to ninety. The class now assembles in the Lecture Hall above the Laboratory, the only room in the College capable of containing such large numbers. Financially this Department of the College is most successful; after defraying the cost of additions to the Law Library made during the year and debiting the class with portions of the salaries of the Librarian and writer, there remains a surplus of more than a thousand rupees. It is to be feared, however, that the majority of the students look upon attendance at lectures as a mere idle formality, only necessary because required by the University as a preliminary to the B. L. Degree; the small number of students entitled to receive certificates of Proficiency in Law at the next anniversary is conclusive evidence of this want of interest in the lectures. The Muthuswami Law scholarship has been awarded to V. M. Fernandez.

Middle School.—I am glad to be able to report that the middle school continues amply to fulfil the hopes entertained at the time of the re-establishment of these classes. After paying the salaries of the English Masters and allowing liberally for the cost of stationery consumed by the pupils, a balance of fully five hundred rupees remains available for reducing the cost of the other departments of the College.

Norton Medal; Other Prizes.—The competition for the Norton Medal and other composition Prizes has not been as active as could be wished. For the Elphinstone English Essay Prize only three candidates competed, two of them however sending in essays of more than usual merit; for the Norton Medal two, one in Tamil and one in Telugu, and for the Kumaravurnha Nambiyar Prize (Malayalam) only a single essay was received. The Morehead Translation Prize, though open to Proficients of not more than ten years' standing as well as to the students of the senior class in the College, only attracted two candidates, for reporting upon the merits of whose translations I am much indebted to the members of the Telugu sub-committee of the Madras School Book and Vernacular Literature Society. I was in hopes that the prospect of having the translation printed by the Society would attract a large number of aspirants, but as far as the present year is concerned, this hope has not been realized, and the translation that is considered by the sub-committee to be decidedly superior to the other is nevertheless pronounced to be written in too difficult a style to be suitable for publication by the Society. The award of the Norton Medal is made on the recommendation of Mr. V. Krishnamachariyar, who has once more been kind enough to take this trouble on our behalf.

Patcheappah Studentships.—The connection that has existed between this College and Patcheappah's High School for more than 30 years comes to an end with the present year. Three years ago the Trustees decided not to appoint any more stipendiary scholars in the Presidency College; their number has therefore diminished year by year, and at present there is only one such student left

whose scholarship will also expire with the current year. As Patcheappah's High School now possesses a senior department of its own, it is only natural that all the funds of the Institutions should be expended within its own walls, but I cannot help regretting the end of a connection which has supplied us in years past with many excellent students, among whom I have the pleasure of reckoning the late Honourable V. Sadagopacharlu, the Hon'ble V. Ramiengar, the Hon'ble A. Seshiah Sastriar, C. Rangacharlu, C.I.E., and in more recent times the present Acting Professor of Logic and Moral Philosophy, Mr. P. Ranganatham Mudaliyar.

The prizes, medals and certificates were next distributed.

Sir CHARLES TURNER then addressed the students, the following being the purport of his remarks. He had to thank Colonel Macdonald for having so clearly alluded toand explained the several changes in connection with education in the Presidency that had taken place during the past year. The appointment with which the several examinations that had been introduced had been received by the gentlemen connected with the various educational institutions shewed that they were generally regarded with favor. Colonel Macdonald had explained that the examinations introduced did not increase the number of examinations. While Sir Charles, did not himself quite approve of a multiplicity of examinations, he yet thought that the office of the Director of Public Instruction could not be effectively carried on without such examinations as had been introduced. He had no doubt that the sound elementary education which would be secured by the new examinations would fit boys to proceed more easily with the higher branches of education. It would be out of place for him, Sir Charles said, at the present meeting to make a long speech, for such of the students as had taken their degree had recently the privilege of listening to a practical address from His Grace the Chancellor of the University, which dealt most fully and carefully with every branch of art and science His Grace had given the students most valuable advice as to the direction to be given to their studies. Sir Charles, for himself, was glad to find so many of the students of the College taking to a study of the law, for he considered law to be a very essential branch of learning. But to such of the students as would make Law a profession he would say do not neglect the other branches of learning, for there was no branch of study so connected with the other branches of learning as was the study of law. The more the man of law knew the more useful could he be to his clients. There was scarcely a single client who would not require some special knowledge on the part of the lawyer. The mechanic, chemist, the merchant would each be more satisfied with a lawyer having a knowledge of his particular line than with one with no such knowledge. In England, the education of a gentleman was considered not to be complete without some knowledge of law. So, as he had said before, he was glad to find so large a number of students taking to the study of the law, but he would repeat that they should not neglect the study of the other branches of knowledge. To such as did not care to make law a profession, he thought the sciences ought to afford a very attractive and profitable branch of study. He specially commended chemistry to the attention of the students and pointed out the great advantages that were to be derived from the study. He referred to the great use that had been discovered in Arasta by means of a knowledge of chemistry, and shewed how similar advantages might be gained by students in India giving their mind to the study. If India was to become a prosperous country Sir Charles thought the science of chemistry ought to be more cultivated. It was a question of great importance to consider what India should send out to other countries in return for what she got from them, and what she experts she ought to be able to send out at as little cost as possible. The question then was, What had they to export? Sir Charles had, in speaking on previous occasions, called attention to the enormous deal of labor to be found in India. Now, the study of chemistry would enable a person to apply this labor to the material in a manner so as to produce very great advantages. Sir Charles had thus spoken of chemistry, but there was not a single branch of science that would not be found a profitable subject of study. Sir Charles next alluded to the high pleasure derived by persons possessing a knowledge of the natural sciences, whereas, he said, a person who had not such knowledge was quite ignorant of such pleasures. Considering the great advantages to be gained from a study of the natural sciences, Sir Charles trusted that next year he would hear that there were not only half a dozen students giving their minds to Natural Philosophy, but half of the school. They were to recollect that they could never have such an opportunity of studying the sciences as they were afforded in school, and they would after they left school miss the aids which would now enable them to get through the subject so easily. Sir Charles regretted that he had not had the opportunity the students in schools now had, and that when he was in school so great attention as was now given to it was not devoted to the sciences. He earnestly entreated the students to give their careful attention to the study of the sciences. There was another point to which he wished to allude, a point which called for some regret. He was sorry to find from the report that so few boys had been induced to send in essays for the splendid prizes offered. It was essential that a boy, in addition to having a good knowledge of subjects, should possess a power of expressing himself clearly and well. It was therefore important that the study of composition should not be neglected. Sir Charles trusted that more attention would hereafter be given by the students to this subject. In conclusion, Sir Charles congratulated the Principal and Professors of the College on the great success that had attended the College at the examinations during the past year. Sir Charles did not mean to say that such results as had been attained were not only what should be expected of an institution such as the Presidency College, but, when it was considered, as had been pointed out by the Director of Public Instruction, that there are so many other institutions of a like kind in Madras and that the Principal could not pick out his students, but had to take all who came to the school, the results were very creditable. Sir Charles trusted that in future years increased successes would attend the College.—*Madras Times.*

MISSION SCHOOLS.

During the past twenty years, all missionary bodies, and especially all missionaries, have become ever more deeply convinced of the necessity and importance of Christian schools as a missionary agency. These two things, along with the experience of their utility, are sufficient to account for this deepening conviction—first, the fact that all education in India not missionary is non-religious; and secondly, that education has been extending with enormous rapidity. In 1858 in all the schools under Government inspection there were not 50,000 pupils; in 1878 there were 300,000. In 1857 the University was constituted, and now as many as 3,000 candidates go up annually for the Matriculation Examination, and 200 for the Degree of Bachelor of Arts. The majority of these naturally belong to the higher castes, and a large proportion are Brahmins. Thus the stream of education has enormously enlarged both in width and depth. The duty accordingly of the Christian Church to pervade this mighty influence with the Christian truth and Christian spirit, and to use it for Christian ends, became both pressing and difficult, as the tide rose so quickly. If it cannot be said that the Church has risen to the full height of her responsibility and done all she might, she has at least not wholly neglected the task, nor allowed the rising generation to grow up entirely under non-religious, which become so easily irreligious, influences. In 1857 there were in Anglo-Vernacular Mission Schools 6,327 boys: in 1878 there were 19,659; in vernacular schools 28,029 and 52,482 in these years respectively; and in girls' schools 8,990 and 26,209. It is manifest at a glance that this growth, considerable as it is, has not kept pace with the general growth of education, as indeed it could not be expected to do. The influence, however, of Christian schools and colleges is not confined to their own pupils. Of more importance, therefore, than their number is the rank which they hold; and in this respect, though with a struggle, they have been able to maintain their place. Some of them have always compared well both in standard and efficiency with corresponding Government Institutions. The erection of one of these Institutions into the Madras Christian College on the wide basis of the union of several Missionary bodies is not only a testimony to its high position, but a proof of the growing value attached to Christian education, and an earnest of happy co-operation on the part of Missionary Societies in the common field and for the common end of their activity.

The influence of Mission Schools on the thousands who pass through them it is impossible to estimate. But testimony comes from all quarters as to the good they effect in various ways. In the first place, there are always instances now and again of young men of the highest castes and possessed of all the advantages and safeguards of an exclusive Hinduism, who are led to burst the bonds by which they are bound to their society and family and all that is most precious to them on earth, and under the influence of the truth alone and for Christ's sake to acknowledge Him as their Lord and unite themselves to His Church. The influence and usefulness of such men in the native Church is far beyond their number. But, secondly, besides the winning of these converts Christian education is exerting an immense influence on thousands who are not yet brought to the point of confessing Christ. Through means of them the conscience of native society is being enlightened and quickened, its ideas are being modified, its feelings elevated and purified, and a congenial soil prepared for the reception of the saving seed of the Kingdom. The papers and discussions in this volume afforded abundant testimony to the help rendered by Christian education in all kinds of mission work, and the change of moral atmosphere which is being produced by its instrumentality. Not a few speak even of secret disciples, whose hearts are given to Christ, although they have not had the courage to break with the system which so closely and firmly hedges them in.

Another benefit of the higher Christian education which must not be overlooked is that which it confers on the native Church, not only in advancing temporally those who are prepared to take advantage of it, but in qualifying Christian men, both laity and clergy, to be the teachers and guides of the growing Christian Church. It is a promising sign for the future of the native Church that, along with the immense increase from the lower castes, there is also a resolution to maintain a high standard of instruction, general and theological, for its pastors and catechists. The latter is indispensable, if the growing Church is to be trained and guided as it ought. —*Review of South Indian Missions* by *Rev. W. Stevenson.*

CORRESPONDENCE.

AYLMER'S FIELD.

A CORRESPONDENT writes to ask for an explanation of the lines:—

> "there, when first
> The tented winter field was broken up
> Into the phalanx of the summer spears
> That [illegible] should wear the garland"—

This passage is a "*crux*" unto many. For a full explanation, we refer our correspondent to the Journal Notes on this poem recently published. (See our advertising columns).

In these Notes will also be found a discussion of the much vexed question as to "the deathless ruler" of line 661—To the question "Who was this deathless ruler?" we have heard returned the following answers:—

(1) The Soul; (2) God; (3) The Devil; (4) Conscience; (5) Mammon, and (6) Pride. For reasons stated in the Notes, we think the last is the correct answer.

—[ED. M. J. OF E.]

EXAMINATION PAPERS.

Matriculation Class.

ALGEBRA.

I. State the conditions under which $a^n + b^n$ and $a^n - b^n$ are divisible by $a + b$.

(*a*) Resolve $a^6 + b^6$ into its factors.

(*b*) Show that $4(4^6 + 3^6)$ ends in 2 ciphers.

II. Resolve $4a^2b^2 - (a^2 + b^2 - c^2)^2$ into 4 factors.

III. Show that $a^3 + b^3 + c^3 - 3abc$ is divisible by $a + b + c$, and hence resolve $x^3 + \frac{1}{x^3} - 18$.

IV. Write down the product of $(x - a)(x - b)(x - c)$ and hence resolve.

$$x^3 - x^2\left(\frac{a}{b} + \frac{b}{c} + \frac{c}{a}\right) + x\left(\frac{a}{c} + \frac{b}{a} + \frac{c}{b}\right) - 1.$$

V. If p divides A and B, then it will divide m A $\pm$ n B.

VI. (*a*) If $\frac{a}{b} = \frac{c}{d}$, show that $\frac{a + b}{a - b} = \frac{c + d}{c - d}$.

(*b*) If $x = \frac{\sqrt[3]{m+1} + \sqrt[3]{m-1}}{\sqrt[3]{m+1} - \sqrt[3]{m-1}}$, find the value of $x^3 - 3mx^2 + 3x - m$.

VII. If $2s = a + b + c$, show that $(s - a)^2 + (s - b)^2 + (s - c)^2 + s^2 = a^2 + b^2 + c^2$.

VIII. If $x = \sqrt[3]{a + \sqrt{a^2 + b^3}} + \sqrt[3]{a - \sqrt{a^2 + b^3}}$, show that $x^3 + 3bx - 2a = 0$.

IX. (*a*) If $x + y + z = 0$, prove that $x^3 + y^3 + z^3 = 3xyz$.

(*b*) Simplify $\frac{(a-b)^3 + (b-c)^3 + (c-a)^3}{(a^2-b^2)^3 + (b^2-c^2)^3 + (c^2-a^2)^3}$.

X. Solve (i) $(x^3 + 8x^2 + 16x - 1)^{\frac{1}{3}} - x = 3$.

(ii) $x^2 + y^2 = 13$; $xy = 6$.

XI. The length of a field is twice its breadth; another field which is 50 yards longer and 10 yards broader contains 6,800 square yards more than the former. Find the size of each.

ARITHMETIC.

I. (*a*) State the rule for converting a mixed circulating decimal into its equivalent vulgar fraction.

(*b*) Simplify

$$\frac{2{\cdot}375}{3{\cdot}16} \text{ of } \frac{4\frac{1}{2}}{{\cdot}0625} \div \frac{8{\cdot}8}{5\frac{1}{2}} \text{ of } {\cdot}571428 - \left\{2{\cdot}8 \text{ of } 2\tfrac{1}{7} - 4\tfrac{1}{5} \text{ of } \frac{4{\cdot}4 - {\cdot}33}{1\frac{1}{3} + 2{\cdot}629}\right\}.$$

II. (*a*) Find by practice the value of 5 tons 19 cwts. 3 qrs. 24 lbs. at £5 13*s.* 11*d.* per cwt.

(*b*) Find the square roots of 5136·160225 and $20\frac{1}{4}\frac{1}{9}$.

III. A watch set accurately at 12 o'clock indicates 10 to 5 at 5 P.M. What is the time when the watch indicates 5 o'clock?

IV. An article is bought and sold thereby gaining 10 p. c. If it were bought at 20 p. c. less and sold for £2 5*s.* more, there would have been a gain of 40 p. c. Find the cost price.

V. The amount of a certain sum with Simple Interest for 20 years is £395 9*s.* and with Simple Interest for 10 years more is £461 7*s.* 2*d.* Find the sum and rate p. c. per annum at which interest is reckoned.

VI. A is at Chingleput and B at Madras (34½ miles apart). A starts for Madras at 8 A.M., and B for Chingleput at 8-30 A.M. They meet each other at 2-30 P.M. and find that B has walked half a mile an hour more than A. Find their rates of walking.

VII. A person has teas worth 4*s.* 2*d.* and 2*s.* 11*d.* per lb. In what proportion must he mix them in order that he may sell the mixture at 3*s.* 10*d.* per lb, and gain 20 p. c. on his outlay?

VIII. A flag staff 64 ft. high snaps in a heavy storm 28 ft. from the bottom; and not being wholly broken off, the top touches the ground. How far is its point of contact from the bottom?

IX. If rice rises 12½ p. c. in price, and before the rise 8 measures were sold for a rupee, how many measures were sold for the rupee subsequent to the rise?

X. A person distributes a certain number of coins among A, B, C and D thus:—

To A he gives ½ of what he has and 1 more,
To B " now has " "
To C " " "
To D " " "

and all the coins in his hand are exhausted. Find the total number of coins.

XI. Two trains travelling on parallel lines in opposite directions at the rates of 25 and 20 miles an hour respectively are observed to pass each other in 8"; and when they are running in the same direction at the same rates as before, they pass each other in 31½". Find the length of the trains.

ENGLISH POETRY AND PROSE.

I. What kind of a poem is "John Gilpin?" In what circumstances was it composed? Write a short summary of the poem.

II. What made Shylock meditate revenge? How did he prevail on Antonio to sign such a dangerous bond? What arguments did the lawyer seem to urge in favour of the Jew in the course of the trial?

III. Explain the following and where necessary, give the allusion :—

(1) He carries weight ; (2) to miss the lumbering of the wheels ; (3) to raise the hue and cry ; (4) to feed fat the ancient grudge I bear him ; (5) [illegible] pleasantest words that ever blotted paper ; (6) all the wealth I had ran in my veins ; (7) how much elder are you than your looks ; (8) all was awful expectation in the court.

IV. (*a*) Criticise the following quotations, and say what they may mean as they stand :—

(1) So you must ride on horseback after we.

(2) " Fair and softly," John he cried.

(*b*) What word is understood in "as they had basted been?" Quote another line in which the same word is understood.

V. Explain the following terms and give illustrative examples from your poetry :—

(1) a defective verb ; (2) a proverb ; (3) the optative mood ; (4) onomatopœia ; (5) periphrasis.

VI. Give the several meanings of "*for*" in the following :—

(1) plead *for* Antonio ; (2) not much the worse *for* wear ; (3) in an agony of distress and fear *for* his friend ; (4) he begged it *for* a fee ; (5) I could not *for* my life deny him ; (6) he would not part with it *for* all the world ; (7) in excuse *for* his fault ; (8) *for* a mere child he is ingenious.

VII. Analyse the following, showing the relation of the clauses to each other :—

The cause was just going to be heard before the duke and senators of Venice in the senate-house, when Portia entered the high court of justice, and presented a letter from Bellario, in which that learned counsellor wrote to the duke, saying, he would have come himself to plead for Antonio, but that he was prevented by sickness, and he requested that the learned young doctor Balthasar (so he called Portia) might be permitted to plead in his stead.

VIII. Express the following in the direct form :—

She addressed herself to Shylock ; and allowing that he had a right by the Venetian law to have the forfeit expressed in the bond, she spoke so sweetly of the noble quality of mercy, as would have softened any heart but the unfeeling Shylock's saying that it dropped as the gentle rain from heaven upon the place beneath ; and how mercy was a double blessing, it blessed him that gave, and him that received it ; and how it became monarchs better than their crowns, being an attribute of God himself ; and that earthly power came nearest to God's, in proportion as mercy tempered justice.

Turn the above into one simple sentence.

IX. Rewrite the following in the mode specified, making as little change as possible :—

(1) " John Gilpin kissed his loving wife ;
O'erjoyed was he to find,
That though on pleasure she was bent,
She had a frugal mind."

Turn the above into one simple sentence.

(2) " His horse, who never in that sort
Had handled been before,
What thing upon his back had got,
Did wonder more and more."

Put the above in Prose order. Also paraphrase it in one simple sentence.

(3) " Antonio was the kindest man that lived the best conditioned, and had the most unwearied spirit in doing courtesies."

Use the adjectives in the positive degree.

(4) " He lived in too expensive a manner for his slender means."

Turn this into a complex sentence.

(5) " His high birth and noble ancestry were all that he could boast of."

Take away " all" and use " only" as an *Adjective*.

(6) " She was not yet old but she could learn."

Point out a redundancy here. Use " young" instead of " old" so as to preserve the same meaning."

(7) " It is well you wish this behind her back, else you would have but an unquiet house."

Turn this into a complex sentence, beginning with a conditional clause.

(8) " They set out the instant they were married."

Use (1) no sooner, (2) scarcely, (3) as soon as.

Physical Geography.

I. Name the various constituents of the atmosphere, and give an account of one of them.

II. Shew by a diagram why the middle of the day is much hotter than the morning or the evening.

III. Quote some statements in the Primer that show that it was written for European and not for Indian students.

IV. What are the Trade winds ? How are they generated ?

V. " All the rivers run into the sea, but the sea does not become full." Why ?

VI. Explain the terms (1) Point of Saturation, (2) Mist, (3) Sleet, (4) Dew, (5) Hail.

VII. What is the difference between hard and soft water ? Which is more useful for washing, and which for drinking purposes ?

VIII. Why is the air colder on the top of a mountain than at the bottom ? Explain this clearly.

IX. Before a storm of rain, the mercury in the barometer frequently falls. What is the cause of this ?

UNIVERSITY OF MADRAS.

First Examination in Arts—1879.

General English.

Examiner.—Rev. A. Alexander, M.A.

I. Paraphrase :—

Deep in the shady sadness of a vale,
Far sunken from the healthy breath of morn,
Far from the fiery noon and eve's one star,
Sat grey-haired Saturn quiet as a stone,
Still as the silence round about his lair;
Forest on forest hung about his head
Like cloud on cloud, no stir of air was there,
Not so much life as on a summer's day
Robs not one light seed from the feathered grass,
But where the dead leaf fell there did it rest.
A stream went voiceless by, still deadened more
By reason of his fallen divinity
Spreading a shade.

II. (*a.*) Classify the Aryan Languages of Europe.

(*b.*) In what ways may we generally distinguish English words of Saxon origin from those derived from Latin and Greek?

(*c.*) At what periods in the history of English do we find a large influx of words from classical sources? Give examples of the kinds of words introduced during each period.

III. (*a.*) Exemplify the various modes of deriving nouns from verbs.

(*b.*) Write a short note on the derivation and history of the following words :—

(1) panic : (2) pedagogue : (3) bedlam : (4) gossip : (5) sycophant : (6) manure.

(*c.*) Give the origin and meaning of the suffixes in the following words, and remark upon the propriety of their use :

(1) witticism : (2) loveth : (3) kingdom : (4) dearth : (5) cheerless : (6) generalize.

IV. What different parts of the verb may the word 'sending' be? ote briefly the history of each.

V. (*a.*) Correct or justify the concord in the following sentences :—

(1.) "Riches certainly make themselves wings : they fly away as an eagle toward heaven."

(2.) The House of Commons have resolved to abolish these duties, although the Board of Directors are of a contrary opinion.

(3.) The canal, so far as the transit of goods and passengers are concerned, has proved a boon to the district.

(4.) 'Fierce as he moved, his silver shafts resound.'

(5.) If I were a magistrate, I will permit no such contempt for the law.

(*b.*) Amend if need be, and give reasons for your emendations.

(1.) King William was advised to remove Lord Somers from office, who, as he was now considered the head of the Whigs, so his wise counsels, and his modest way of laying them before the king, had gained him a great share of his esteem.

(2.) Instead of buying a book to you, my intention is to give you my own in a present, as I know you have much need for it.

(3.) It is to be hoped that such an occurrence will always remain unprecedented in the future, as it has been in the past.

(4.) The Royal train arrived in the station at 7-45 o'clock and was received by the magistrates.

(5.) I have neither the time nor the money to spend on such an enterprise.

VI. Write a short essay (not to exceed two pages) on either of the following subjects :—

(1.) War, its evils and uses

or

(2.) A description of the country during the Famine.

VII. Explain the italicised expressions in the following sentences :

(1.) It was a very pleasing picture, *painted after Titian*.

(2.) The speaker went on *talking against time*, for over an hour.

(3.) Walpole *had been in power* so long that it was felt by everybody that the time had come for his enemies *to have their innings*.

(4.) Do not imagine that *I am speaking without book* on the present occasion.

(5) Your friend the poet is not likely *to set the Thames on fire*.

(6) One would scarcely expect a British soldier *to show the white feather*.

VIII. (*a.*) Write sentences, bringing out the different meaning expressed by each word in the following sets :

(1) sensuous, sensual, sensational, sensible, sensitive.
(2) operative, operatic.
(3) manner, manners, mannerism.
(4) ingenuity, ingenuousness.
(5) notable, notorious, noted.

(*b.*) Illustrate the various uses of the following words :

(1) may ; (2) we ; (3) do ; (4) it ; (5) for.

IX. Name and define the figures of speech in the following lines, nd explain more fully the similarities implied :—

Hark! the rushing snow,
The sun awakened avalanche whose mass,
Thrice sifted by the storm, had gathered there,
Flake after flake ; in heaven-defying minds
As thought by thought is piled, till some great truth
Is loosened, and the nations echo round,
Shaken to their roots, as do the mountains now.

Algebra and Geometry.

Examiner.—P. Ratnavelu Chestyar, B.A., C.S.

I. Divide a straight line into two such parts that the rectangle contained by the whole line and one of the parts may be equal to the square on the other part.

Shew that the construction is derived from the positive root of a certain quadratic equation, and give a geometrical interpretation of the negative root, illustrating it by the same figure.

II. The bisectors of the vertical angle of a triangle and its supplement, divide the base respectively in the ratio of the sides.

Find the harmonic mean of two concurrent and conterminous straight lines.

III. Inscribe a circle in a given triangle.

The radius of the circle touching one of the sides of a triangle and the other two sides produced, bears the same ratio to that of the circle inscribed in it, as the sum of the sides of the triangle bears to that sum diminished by the side not produced.

IV. The rectangles contained by the opposite sides of a quadrilateral inscribed in a circle, are together equal to the rectangle contained by its diagonals.

Two sides of an acute-angled triangle are given in position and their sum is constant; shew that the circle circumscribing the triangle passes through two fixed points.

V. If $x + yz = \{(1 - a^2)(1 - y^2)(1 - z^2)\}^{\frac{1}{2}}$

$y + zx = \{(1 - b^2)(1 - z^2)(1 - x^2)\}^{\frac{1}{2}}$

and $z + xy = \{(1 - c^2)(1 - x^2)(1 - y^2)\}^{\frac{1}{2}}$,

shew that $\frac{x^2 - y^2}{a^2 - b^2} = \frac{y^2 - z^2}{b^2 - c^2} = \frac{z^2 - x^2}{c^2 - a^2}$

VI. If α and β are the unequal real roots of the quadratic equation $ax^2 + bx + c = 0$, the expression $ax^2 + bx + c$ has the same sign as a for all real values of x not lying between α and β.

For what values of x, in terms of α, β and x, would the expression $a + bx + cx^2) + (2a\alpha + b\alpha^2)\, r + a\alpha^2 r^2$ have the same sign as a?

VII. Given the sum of an arithmetical series, the first term and the common difference, find the number of terms and interpret the result when one of the values arrived at is a negative integer.

Shew, without applying the formula for the sum of the squares of the first n natural numbers, that

$$a^2 + (a+b)^2 + (a+2b)^2 \ldots\ldots + (a+nb)^2 = (n+1)a^2 + n(n+1)ab + \frac{n(n+1)(2n+1)b^2}{6}$$

VIII. Find the number of permutations of n things all together, when they are not all different.

If N_r denote the number of permutations of n different things, taken r together, shew that $(M + N)_r$

$$= M_r + r.M_{r-1}N_1 + \frac{r(r-1)}{1.2}.M_{r-2}N_2 + \ldots\ldots + r.M_1N_{r-1} + N_r$$

IX. Assuming the Binomial Theorem to be true for a positive integral exponent, prove it when the exponent is a negative integer.

Shew that $\sqrt[7]{\frac{10}{7}} = 1 + \frac{1}{10} + \frac{1.4}{10.20} + \frac{1.4.7}{10.20.30} \ldots$ ad inf.

Physiology.

Examiner.—Surgeon-Major E. F. Brockman, F.R.C.S.

I. Enumerate the structures which compose the skin, and describe its functions.

II. Healthy urine:—name its constituents. State its specific gravity, and the normal quantity passed in 24 hours by an adult.

III. In what vessels is the purest blood to be found? give reasons.

IV. Name the contents of (*a*) the Thoracic, and (*b*) the Abdominal cavities.

V. What are the physical conditions in the Lungs which effect the change from Venous to Arterial blood? What quantities of C and H_2O are eliminated in 24 hours in the lungs?

VI. Where are the following substances found:

Glycogen, ptyalin, lactic acid and cholesterine. What functions do they severally perform?

VII. In what manner would ligature of the common choledic duct effect the process of digestion?

VIII. Describe the changes occurring in the blood in its passage from a fluid to a solid form. Mention any circumstances which accelerate or retard the process.

Trigonometry and Euclid, Book XI.

Examiner.—J. Marsh, Esq.

I. Find the formula connecting the circular measure of any angle with the measure of the same angle in degrees.

Express, in circular measure and in degrees, one of the angles containing a solid angle of a dodecahedron.

II. Prove, when A lies in the third quadrant, that:—

(1) $\sec(-A) = \sec A$

(2) $\sin A = -\sin(A - 180^\circ)$

(3) $\cos(90^\circ + A) = -\sin A$.

III. Express the cosine of the sum of two angles (the sum of the two angles lying in the second quadrant) in terms of the sines and cosine of the angles themselves.

Simplify $\frac{\cos 6A + 6\cos 4A + 15\cos 2A + 10}{\cos 5A + 5\cos 3A + 10\cos A}$.

IV. (*a.*) If $\frac{\sin(x + A)}{\sin(x + B)} = \sqrt{\frac{\sin 2A}{\sin 2B}}$ shew that $\tan^2 x = \tan A \tan B$.

(*b.*) Solve $\cos^2 A \sin 3A + \sin^2 A \cos 3A = \frac{1}{2}$.

V. Find the relation between the logarithms of the same number in different bases. Show from the result how to find $\log_e 100$.

If $a^x + b^y = c$, and $a^x - b^y = d$, then $x = \dfrac{\log \frac{1}{2}(c+d)}{\log a}$,

and $y = \dfrac{\log \frac{1}{2}(c-d)}{\log b}$

VI. If A, B, and C be the angles of a triangle, show that :—

$$(\sin A + \sin B + \sin C)\left(\tan\frac{A}{2} + \tan\frac{B}{2} + \tan\frac{C}{2}\right) = 4 + 4\sin\frac{A}{2}\sin\frac{B}{2}\sin\frac{C}{2}.$$

VII. Find the radius of the circle which touches one side of a triangle and the other sides produced.

If r, r_1, r_2, r_3 be the radii of the inscribed and escribed circles of a triangle, show that $S = \sqrt{r.r_1.r_2.r_3}$ (S being the area of the triangle.)

VIII. From the top of a tower of known height, the altitude of a cloud, whose shadow falls on a certain place at a known distance from the tower, is observed. Given the altitude of the sun at the time of observation, show how the height of the cloud may be found.

IX. Define a cone, a cylinder, and an icosahedron.

X. Draw a straight line perpendicular to a given plane from a given point without it.

XI. If a straight line be at right angles to a plane, every plane which passes through it shall be at right angles to that plane.

XII. Which of the solid figures defined by Euclid, if cut by a plane parallel to the base, will have a section similar to the base? Prove this in the case of one of the solids you name.

SOLUTIONS.

(By a Correspondent.)

I. See chapter II, Todhunter's Trigonometry.

Circular measure of $180 = \pi$

do. $108 = \frac{3}{5}\pi$

II. See chapter IV, Todhunter's Trigonometry.

III. See chapter VI, Todhunter's Trigonometry.

Rider — Miscellaneous Examples.

Example 218.

The numerator can be expressed in powers of θ; and it will be found to reduce to $2^5\cos^6\theta$; in like manner the denominator will be found to reduce to $2^4\cos^5\theta$. See Art. 280. Hence the expression reduces to $2\cos\theta$.

Key to Trigonometry.

IV. (*a*) See Miscellaneous Examples.

Exercise 131.

$$\frac{\sin(x+A)}{\sqrt{\sin 2A}} = \frac{\sin(x+B)}{\sqrt{\sin 2B}}$$

$$\frac{\sin x\cos A + \cos x\sin A}{\sqrt{\sin 2A}} = \frac{\sin x\cos B + \cos x\sin B}{\sqrt{\sin 2B}}$$

$$\frac{\cos A(\tan A + \tan x)}{\sqrt{\sin 2A}} = \frac{\cos B(\tan B + \tan x)}{\sqrt{\sin 2B}}$$

$$\frac{\tan A + \tan x}{\sqrt{\tan A}} = \frac{\tan B + \tan x}{\sqrt{\tan B}}$$

$$\tan x(\sqrt{\tan B} - \sqrt{\tan A}) = \sqrt{\tan A\tan B}(\sqrt{\tan B} - \sqrt{\tan A})$$

$$\tan x = \sqrt{\tan A\tan B}$$

Key to Trigonometry.

IV. (*b*) $\cos^3 A\sin 3A + \sin^3 A\cos 3A = \frac{3}{4}$

See Chapter VI Exercise 27.

$$\cos^3 A\sin 3A + \sin^3 A\cos 3A = \tfrac{3}{4}\sin 4A$$

$$\tfrac{3}{4} = \tfrac{3}{4}\sin 4A$$

$$\sin 4A = 1 = \sin 90^\circ$$

$$4A = 2m\pi + \frac{\pi}{2}$$

V. See Todhunter's Trigonometry, Chapter, 10.

$$\log_b m = \log_a m \times \log_b a$$

$$\log_e 100 = \log_{10} 100 \times \log_e 10$$

$$\log_e 100 = 2 \times 2{\cdot}302 = 4{\cdot}604\ldots\ldots$$

$$a^x + b^y = c;\ a^x - b^y = d$$

$$a^x = \frac{c+d}{2}$$

$$x\log a = \log\frac{c+d}{2}, \text{ &c.}$$

VI. See Miscellaneous Exercises, No. 185.

$$\sin A + \sin B + \sin C = 4\cos\frac{A}{2}\cos\frac{B}{2}\cos\frac{C}{2}$$

$$\tan\frac{A}{2}\tan\frac{B}{2} = \frac{\cos\frac{C}{2}}{\cos\frac{A}{2}\cos\frac{B}{2}}$$

$$\tan\frac{A}{2} + \tan\frac{B}{2} + \tan\frac{C}{2} = \frac{\cos^2\frac{C}{2} + \sin\frac{C}{2}\cos\frac{A}{2}\cos\frac{B}{2}}{\cos\frac{A}{2}\cos\frac{B}{2}\cos\frac{C}{2}}$$

$$= \frac{1 - \sin^2\frac{C}{2} + \sin\frac{C}{2}\cos\frac{A}{2}\cos\frac{B}{2}}{\cos\frac{A}{2}\cos\frac{B}{2}\cos\frac{C}{2}}$$

$$= \frac{1 - \sin\frac{C}{2}\left(\cos\frac{A+B}{2} - \cos\frac{A}{2}\cos\frac{B}{2}\right)}{\cos\frac{A}{2}\cos\frac{B}{2}\cos\frac{C}{2}}$$

$$= \frac{1 + \sin\frac{A}{2}\sin\frac{B}{2}\sin\frac{C}{2}}{\cos\frac{A}{2}\cos\frac{B}{2}\cos\frac{C}{2}}$$

Hence $(\sin A + \sin B + \sin C)\left(\tan\frac{A}{2} + \tan\frac{B}{2} + \tan\frac{C}{2}\right)$

$$= 4 + 4\sin\frac{A}{2}\sin\frac{B}{2}\sin\frac{C}{2}$$

Key to Trigonometry.

VII. See Chapter XVI, Todhunter's Trigonometry.
See Miscellaneous Exercise, No. 221.

$$\gamma\gamma_1\gamma_2\gamma_3 = \frac{S^4}{s(s-a)(s-b)(s-c)} = S^2$$

$$\sqrt{\gamma\gamma_1\gamma_2\gamma_3} = S.$$

Key to Trigonometry.

VIII. See Tod. Trigonometry for beginners, Chapter 12, Ex. 20.
The altitude of the cloud

$$= \frac{c\sin\alpha\sin\beta}{\sin(\alpha-\beta)}$$

If a be the known height of the tower, the height of the cloud from the horizontal plane

$$= a + \frac{c\sin\alpha\sin\beta}{\sin(\alpha-\beta)}$$

IX. See Todhunter's Euclid.
X. Proposition 11, Book XI.
XI. Proposition 18, Book XI.
XII. A Cylinder, a prism, a cone, a pyramid, a cube.
See Todhunter's Exercises on Euclid, Book XI. Nos. 437, 438

LA SHASTRA.

GRANT-IN-AID SYSTEM.

READ the following papers:—

No. 13. From the Rev. W. STEVENSON, Secretary of the Executive Missionary Education Committee, to the Acting Chief Secretary to Government, dated, Madras, 10th December 1879.

I have the honor to forward herewith a letter in reply to the remarks of the Director of Public Instruction on the Memorial on Aided Education made in his letter to Government dated 1st May 1879. That the Committee, who now beg to submit this letter, are authorized to represent the Memorialists you will see from the enclosed Resolutions, page 3, of the South India Missionary Conference held at Bangalore in June last.

ENCLOSURE No. 1.

From the Executive Missionary Education Committee, to the Acting Chief Secretary to Government, dated Madras, 2nd December 1879.

As representatives of those who in March last presented a Memorial on the working of the Grant-in-aid System, we desire through you humbly to request the attention of His Grace the Governor in Council to some remarks on the reply made by the Director of Public Instruction to the Memorial in question.

A. In that reply there are, in the first place, some subordinate details on which we would briefly touch.

1. The Director seems to think that he has convicted the Memorialists of error when he shows that "much of the increase in the number of pupils in private schools which the Memorialists ascribe to the Code of 1864 was due to the Results Rules which came into force in 1868." It appears to us, however, that the Results Rules of 1868 were only the amplification and completion of the scheme set on foot in 1864. It was partly for this reason that the Memorialists pitched upon the year 1869-70 as the earliest in which the effect of the measures of 1864 could be clearly seen. Regard for conciseness forbade their entering into minute details, and the question of results-grants as distinct from salary-grants, though of great importance in its own place, bears merely upon the mode of administering grants-in-aid, not upon the general principles that underlie them. To us the rules for salary-grants passed in 1864 and the rules for results-grants also passed in 1864, but largely modified in 1868, seem part of one scheme which began to produce its full effect in 1869.

2. The Director says, in paragraph 12 of his summary, that "The Memorialists are entirely mistaken in asserting that the expenditure on direct Government education has increased by 45 per cent. and the expenditure on grants-in-aid has decreased by 9·4 per cent. in 1876-77 as compared with 1869-70." We beg leave to remark that the Memorialists of course depended for information on the tables appended to the Reports on Public Instruction, and that their inferences from these tables are based in every case on the plain and obvious interpretation of them. We submit also that the explanations now given by the Director leave untouched the main contention of the Memorial. This contention is that while the Despatch of 1854 prescribes a gradual movement in the direction of reducing Government in favor of Aided Education, the decided tendency of the present educational policy is in the opposite direction; and that the Memorialists are right in their contention as the Director's own figures prove. By explaining the tables the Director makes out that, instead of a reduction, there has been an increase of Rs. 8,873-9-5 in grants-in-aid since 1869-70, and that the increase of expenditure on Government Institutions amounts not to Rs. 96,171-15-4 as the Memorialists supposed, but only to Rs. 54,919-9-0. Thus, even if the revised figures be accepted, we cannot regard them as showing that the balance has been kept even between the two kinds of education, still less as showing that satisfactory progress i

being made in carrying out the often-reiterated policy of substituting aided local effort for the direct action of the Educational Department.

3. The Director, however, maintains in paragraph 13 that the net and not the gross expenditure on Government Schools should alone be taken into account, and by this mode of reckoning he reduces the increased outlay on them to Rs. 11,549-9-6, which is still, it will be observed, a larger sum than the increased outlay which he claims to be making under the head of grants-in-aid. We venture to ask attention to what such a mode of reckoning really implies. It means that in the case of Government Schools all increased resources shall be spent in strengthening and enlarging them. But both in the paper under consideration and in his actual administration the Director holds that in the case of Aided Institutions any increase of fees or other local resources should be followed by corresponding diminution of aid from Government; in other words that Aided Institutions are not to be enlarged or strengthened by any natural process of development. A good school can now raise a steadily-increasing sum in fees in almost every district. If this increased resources is to be devoted in one class of schools to their constant development, while in another class it is met by corresponding reduction of other resources so that they are kept always stationary, it needs no proof that sooner or later the former class will drive the latter from the field. We cannot but regard the Director's frank avowal that he wishes to deal with the two classes of schools on such different principles as bringing out the tendency of present administration very clearly.

It seems to us that in most cases the increase of fees should be devoted mainly to the reduction of expense, but it cannot possibly be right to apply it to this object in Aided Schools, and in the case of Government Schools to apply it to their enlargement and development. Whatever mode of reckoning is adopted should be applied equally to both.

4. We willingly admit that those who presented the Memorial in March last were in error when they said that their opinion had not been asked on the new Rules for grants-in-aid that were then under the consideration of Government. It appears that those Rules were practically almost the same as those on which the opinion of parties interested in Aided Education had been both asked and given some five years before. We submit, however, that when the Memorialists were informed that the Director had submitted to Government a "revised" Code of Rules in January 1878, they could scarcely be expected to understand that it was the same that had been brought to their notice in the beginning of 1874.

All difficulty on this point has, however, been removed through His Grace the Governor in Council having granted the prayer of the Memorial by sending the Rules in question to the Memorialists for their remarks. We trust it will be found possible to bring these Rules, with such emendations on them as the Memorialists have suggested, into unrestricted operations at an early date.

5. The Director holds, in paragraph 16, that the establishment of two classes in the Middle School of the Presidency College "has not entailed any additional expenditure on Government as asserted in the Memorial." The statement of the Memorial was based solely on the Director's tables, but it is now explained that about half the outlay there set down against the new classes consists of portions of the salaries of gentlemen whom Government have to pay in any case. It seems to us to make little difference in the real expense of a class whether it takes the form of direct outlay of money or of the employment of Government servants in conducting it whose time, if they were not so employed, might be at the disposal of Government for other purposes.

Probably, however, we should not think it necessary to refer to this point were it not for a remark of the Director which seems to us to justify

all the apprehensions of the Memorialists. The Director says in paragraph 3 that the establishment of an upper and lower fourth class in the Presidency College "has taught the important lesson that even in the town of Madras an increase of gross expenditure on education may be the means of obtaining a decrease of net expenditure." We beg leave to point out that classes attached to a great institution like the Presidency College, supported by the prestige of Government and the influence of a great department, can always command pupils at the expense of other schools. It would not be wonderful if such classes became self-supporting even with a mode of reckoning that every one would regard as fair. But the self-support of such an institution makes it only more difficult for others to support themselves. We submit that the Director's aim should be to make all schools, and not this one only, as far as possible self-supporting, and that he should therefore seek, as soon as other considerations render it advisable, to withdraw a school which in the very nature of the case makes it difficult for other schools to retain their most hopeful and their wealthiest pupils. If, however, the Director is resolved, as his remark seems to indicate, to extend Government Education whenever it can be done without increase of expense, disregarding the interests of Aided Education, we cannot but hold his policy to be plainly out of harmony with that of the Despatch.

In the same paragraph the Director appears to ascribe to the Memorialists a feeling of hostility to the Presidency College and a desire that it should be abolished. We entirely disclaim any such hostility, and we are strongly of opinion that it should not be withdrawn without a secular Aided College to take its place. We cannot, however, but express our conviction that the school classes attached to the Presidency College ought gradually to be abolished as was at one time being done. We desire nothing premature or hasty. But, if the former course of action were renewed and the school classes in the Presidency College judiciously removed, it is our firm conviction (1) that the usefulness of the college proper would in no way be impaired, and (2) that the self-supporting power of other institutions would so increase that all *school* education in the town of Madras might very soon be safely left to maintain itself, and the grants now devoted to it be saved for other purposes.

6. With regard to the Madras Christian College the Director seems to us simply to pass over the argument of the Memorial to the effect that an institution which had been receiving a grant amounting only to one-fifth of its whole expense *ought* not to have that grant cut down in the same way as institutions that had been in receipt of nearly one-half of their total outlay. But we understand that the Managers of the College have laid their own view of the case before His Grace the Governor in Council, and it is unnecessary for us to discuss it here. We cannot but, however, express our conviction that the special position which the Christian College occupies—a position at least as special and peculiar among Aided Institutions as the Presidency College holds among Government Institutions—justly entitles it to as special consideration as the latter. Instead of receiving this, however, it does not receive even the aid to which it is entitled on merely general grounds.

7. We cannot admit that "the establishment of First Arts classes in the Government Schools at Salem and Cuddalore has been carried out without entailing any additional expenditure on Government." The Director says that the expense newly incurred at Salem has been met by the abolition of the chair of Vernacular Literature in the Presidency College, and that "at Cuddalore an additional master has been obtained by transferring a teacher from the Madras Normal School." We venture to submit that the maintenance of unnecessary outlay is a form of expenditure as truly as the incurring of new liabilities. When a chair is found to be useless the sum it costs might be saved, and when a teacher is found unnecessary

ary in one school he might be transferred to some vacancy in another without a new post being created for him to fill. Besides, though the addition of a single master to each of the schools in question may suffice for the current year, much more will be required to develop them to the extent intended. We see no reason to doubt the estimate of the Memorial that turning these schools into colleges will entail, when the development is complete, an additional outlay of somewhere about Rs. 10,000 a year.

Nor can it be admitted that the Director fairly represents the Memorialists when he says that they proceed upon the theory "that the interests of a whole district are to be sacrificed to the imaginary interests of some private school." On the contrary we maintain (1) that it is for the true interest of the districts in question that young men seeking a liberal education should attend some of the well-equipped colleges in the neighbourhood; (2) that, if it is desired to make up to these districts for their not having efficient colleges actually within their bounds, this object may be attained in the best and least expensive way by a well-devised scheme of district scholarships; and (3) that there are few ways of spending money on education that do less good and more harm than the multiplication of small struggling colleges, such as those at Salem and Cuddalore will always be.

B. We pass, however, from special points like the above to the main question involved in the Memorial.

We agree with the Director in thinking it highly desirable that the controversy about the construction of the Despatch of 1854 should be closed by some authoritative decision," but we submit that it cannot be either satisfactorily or permanently closed unless the position taken up by the Memorialists is at least understood by those who give the decision. Now the Director throughout his paper represents the Memorialists as claiming that in virtue of the Despatch of 1854 Government Schools and Colleges should be withdrawn wherever a Mission School or College comes into existence. No such claim was made in the Memorial. It pleaded the cause, not of Mission, but of Aided Education. Its main prayer would be granted if an effort were made to transfer the management of Government Schools and Colleges to Local Committees of native gentlemen, even though not a single Mission Institution received any direct benefit from the change. The Memorial interpreted the Despatch of 1854 as laying down the principle that the direct action of the Educational Department should be replaced wherever possible by local effort aided by Government. It did not hold that this local effort should be in all cases, or necessarily in any case, that of a Missionary body, but it expressed the fear that the tendency of present administration is so to strengthen and establish Government Schools and Colleges that no local effort of any kind will ever be allowed to provide substitutes for them, so that the great leading principle of the Despatch of 1854 will become practically a dead letter.

No doubt it appears to us that when there is no special reason to the contrary, Mission Schools should be treated on the same principle as any other Aided Schools and should receive equal consideration. But we are far from saying, and we do not understand the Memorialists to have said, that no consideration is ever to be paid to the nature of the Aided School that might have to supply the educational wants of a district on the removal of a Government School. Cases might arise in which it might be inexpedient to leave a town or district dependent for education on a Mission School alone. Each case would have to be wisely dealt with on its own merits. We repudiate the charge which the Director makes against the Missionaries of Southern India of seeking to draw Government on to commit a breach of its avowed policy of religious neutrality. We are as anxious for real neutrality on the part of Government as any one can be. We should strongly deprecate anything that would practically drive the children of unwilling parents, few as we believe they are, into Mission

Schools, though the Director represents this as the one aim of the Memorial. The Memorial, as we understand it, carefully avoided asking for any favor to Mission Schools as such. It confined itself to asking that measures should be taken to carry out the policy of the Despatch of 1854 in favor of Aided Education generally. We believe that the enforcement of that policy *would not directly benefit any large number of Mission Institutions*. It is by institutions managed by Local Committees, which would consist in most cases of Hindu gentlemen, that we think Government Institutions ought generally to be replaced. It is for the good of the country at large, not for the special benefit of Mission Schools, that we desire to see the policy of the Despatch acted on. There may be some, but certainly there are not very many, Mission Schools in Southern India that would be directly gainers through the withdrawal of the Educational Department from the maintenance of schools. But we believe that, if encouragement were given, many existing Government Schools might be at once transferred to the management of local non-Missionary bodies. We believe that, if this process were once begun, it might go on steadily, if not very rapidly, until the need for any institutions being maintained by Government had manifestly ceased. We believe that such a process with such a result would be useful in many ways and was unmistakeably desired by those who framed the Despatch of 1854. It was for the setting on foot of such a process that the Memorial pleaded. Thus, if the real aim of the Memorialists be kept in view, the twenty-four pages in which the Director revives the groundless charges that have been brought at various times against Missionary education and the aims of Missionaries will be seen to have no bearing on the matter in hand.

The Director simply takes for granted that the only alternative is between a Government and a Mission Institution, but we submit that such a view is out of harmony with the facts of the case. Hindu gentlemen are too sensible of the advantages that India derives from the British Government, and too loyal to open schools in direct opposition to the desires of a Government Department; but, if that department encouraged them, they would in many cases undertake the duty cheerfully, and we are sure that when once undertaken they would feel an interest in it and discharge it with constantly-increasing vigour and success. We are sure also that the management of such schools and colleges would have the happiest effect on the community in many ways, and in particular—to quote the words of the Despatch—that it would foster "a spirit of reliance upon local exertions and combination for local purposes, which is itself of no mean importance to the well-being of a nation." *We further submit that an ample experience has shown the reasonableness of the expectations which we cherish.* Schools and colleges under local, yet not Missionary, management already exist and prosper in many parts of Southern India. We need not refer to the colleges at Trivandrum and Ernaculum, both under native management, yet both holding a most distinguished place among the institutions affiliated to the University of Madras. Nor need we refer to the long-continued and uninterrupted prosperity and usefulness of Patcheappah's High School. Possibly these may be called exceptional cases. But in nearly all districts of the Presidency it is abundantly shown how much interested and how successful native gentlemen and native committees may become in the management of colleges and schools. The Hindu College at Tinnevelly, the Colleges at Coimbatore, Vizagapatam, and Vizianagram, the Hindu Proprietary School, the *Anglo-Vernacular School* in Triplicane, the Hindu High Schools at Masulipatam, Nellore, Bezvada, Narsapur, the Town School in Kumbakonam, Patcheappa's Branch Schools at Chidambaram and Conjeveram are only examples of what the native community are well able to effect in this line *when encouragement is given to them.* These Colleges and Schools were encouraged and in some cases diligently

fostered by the Educational Department. They, therefore, came into existence and are now maintained with ease, though some of them have to stand pretty severe competition with the Mission Institutions by their side. We are not aware of an instance in which such Aided Schools have been encouraged in the same way either in the room or by the side of a Government School, except the single one of the town School at Kumbakonam when the Government School had become overcrowded and where it was well known that the new institution would act as a feeder to it. But, if encouragement were afforded, there seems no reason why local committees should not take over and manage the leading school or college in those towns which have their educational wants supplied at present by Government institutions. If the Educational Department earnestly endeavoured to carry out the policy of the Despatch, it seems to us that the change in question might be effected in some of these towns at once, and in all of them in the course of time. A mode of action that has been thoroughly successful in Tinnevelly and Coimbatore and Mouliputtan would not be likely to fail—if the same encouragement were given it—in Madura or Chittoor or Ramnaddy.

It may seem superfluous to give reasons for the practical carrying out of a policy which Government has so often expressed its cordial approval, but there is one of those reasons which deserves more attention than it has hitherto received. It is that the Educational Department of Government, if it carried out this policy, would exercise a more complete as well as healthy control over all education than it can possibly exert at present. The need of a central and controlling authority in all educational matters is necessarily very great in a country like India, and in the present condition of India that authority, so far as non-university education is concerned, cannot be so advantageously vested anywhere as in a Department of Government. If that Department were once confined to the functions of supervision and inspection, as contemplated in the Despatch of 1854, an initiative in all changes would be gladly given to it and its legitimate influence would be welcomed by all connected with education in a way that it is vain to look for so long as the Department comes into direct competition with those whom it should be guiding. We do not wish to be understood as desiring to bring a charge of intentional unfairness against the Department, but it is universally acknowledged as a sound maxim that no man should be a judge in cases to which he is himself a party. We are aware that changes of the kind we advocate must be judicious and gradual, and we believe the Memorialists would not have approached Government in this matter if progress, however slow, were being made in the direction indicated. Their Memorial was prompted by observing that all the recent action of the Department was establishing—it may be unintentionally—a tendency in an exactly opposite direction.

We desire to conclude by saying that there are many reasons why we humbly think that the time has come when an effort may be advantageously made for completing the scheme of Indian education on the lines laid down in the Despatch of 1854, and that not the least weighty of these reasons is that in proportion as that effort came nearer to complete success it would give to the Government Department a control over education, and a far-reaching influence willingly submitted to by all concerned, such as in the very nature of the case it cannot possess at present.

We have, &c.,

(Signed) GEORGE PATTISON,
(„) D. SINCLAIR,
(„) WILLIAM MILLER,
(„) WALTER JOSS,
and four others.

No. 2413.

Referred to the Director of Public Instruction for early remarks.

(Signed) H. B. GRIGG,
Acting Under Secy. to Govt.

13th December 1879.

No 14. From Colonel R. Mc MACDONALD, Director of Public Instruction, to the Chief Secretary to Government, dated Madras, 17th March 1880, No. 200-P.

I have the honor to submit the following remarks on the accompanying letter from the Executive Missionary Committee of the 2nd ultimo referred to under docket, No 2413, of the 13th ultimo.

2. In my previous letter I pointed out that much of the increase in the number of pupils which the Memorialists ascribe to the Code of 1854 was due to the Results Rules which came into force in 1868, for, although the Code of 1864 did contain rules for results grants, these rules had proved practically inoperative. As the Memorialists spoke only of the Code of 1854 and described it as one in which the "main principle adopted was that of salary grants," it was scarcely to be expected from their language that they remembered the Results Rules of 1868 which were introduced by them. It now appears that the omission of all reference to this feature of the case was deliberate and arose from "regard for conciseness." The Committee regard the results rules of 1868 as part of the scheme of 1864. Every new set of rules is necessarily a modification of some previous set of rules, and it might almost as well be said that the Code of 1864 was part of the Code of 1858, for if the main principle of the Code of 1864 was that of salary grants, it was no new principle. The Code of 1858 contained an elaborate set of rules for salary grants and the modifications of these rules in 1864 were not greater than the modifications of the results rules in 1868. The system of salary grants began in fact at even a more remote period than 1858, for salary grants were given from the very beginning under the rules of 1855.

3. In paragraph 32 of my previous letter I pointed out that I succeeded Mr. Powell on the 27th March 1875, and that there was no apparent reason why the Memorialists should have gone back to the year 1869-70 for the purpose of attempting to show that the expenditure on direct Government education had increased in 1875-76 by 45 per cent. and that the expenditure on grants-in-aid had decreased by 9·4 per cent. It was obvious that even if all the facts asserted had been true, such a comparison as that made could have in no way shewn the "tendency of the present educational administration" and was therefore not only irrelevant, but misleading. It will be observed that not only do the Committee express no regret for what I hoped was merely an unintentional injustice, but that they still attempt to make it appear that my explanations leave the main contention of the Memorial untouched. I have shown that, apart from the illogical nature of the argument used in support of their contention, the Memorialists are entirely wrong in their figures; that the grant-in-aid expenditure increased instead of decreasing during the period in question; that the gross increase on direct Government education was far less than the Memorialists supposed; and that the net increase was altogether insignificant. I have endeavoured, by going through the history of transactions with most of which I had nothing to do, to show the constituent items of the gross increase, such as it is. The Committee have therefore had an opportunity of stating their objections in detail, but they have not availed themselves of it, and it is obvious that any attempt to go into these details would at once have exposed the fallacy of their case.

4. The Committee point out that, while the net expenditure on direct Government education has increased according to my figures by Rs. 11,549-9-6, the increased expenditure on grants-in-aid from Provincial

Funds is only Rs. 8,873-9-5. This no doubt gives a small balance in favor of expenditure on Government Schools of Rs. 2,676-0-1, and this is represented as a grievance, but the Committee have failed to notice my remark in paragraph 33 that the expenditure on Government Girls' Schools was the result of the Missionary Memorial of April 1873, and that, if there had not been this Missionary interference, the balance would have been the other way.

5. The Committee state that I hold that in the case of Aided Institutions any increase of fees or other local resources should be followed by corresponding diminutions of aid from Government; in other words that Aided Institutions are not to be enlarged or strengthened by any natural process of development. The words used by me in paragraph 29 are as follow: "In England the educational grant is continually growing. In India under the decentralization scheme a fixed sum is assigned to each Local Government for Provincial Services, and all that seems possible is to economize most of the limited sum available by gradually reducing the grants to schools, which are to a large extent self-supporting and giving new grants to those schools which are most in need of aid. That policy is the one which has been steadily pursued in Bengal, and the attempt to introduce it on a very limited scale in this Presidency is the immediate cause of this Memorial." The principle which should be pursued with regard to Government Schools and Aided Schools is, I think, the same. As great results should be produced as possible with the limited funds available and money should be spent where it is most needed.

6. I showed in my former letter that the establishment of two additional classes in the Middle School of the Presidency College had not entailed any additional expenditure on Government as asserted in the Memorial, but had on the contrary yielded a large profit. The Committee are alarmed at my remarking that the establishment of these classes has "taught the important lesson that even in the town of Madras increase of gross expenditure on education may be the means of obtaining a decrease of net expenditure." That the education for three years and a quarter of some sixty or seventy boys has been carried on in the principal Government Institution of this Presidency, not only without any expense to the State, but with a profit of something like 26 per cent. on the sum expended, is surely a significant and promising fact. It proves that English education up to the Middle School standard has become, or will soon become, self-supporting, wherever tolerably large classes can be formed. It is an entire delusion to suppose that what has been done in the Presidency College cannot be done elsewhere. There is abundant evidence that both Government and Aided Schools are gradually becoming more and more self-supporting in all large towns. The Committee consider that it should be my aim to make all schools as far as possible self-supporting. This aim has been steadily kept in view. Schools are made self-supporting by gradually raising the scale of fees, and from time to time the fees have been raised. The scale now in force came into effect on the 1st January 1878, and a reference to page 195 of the Report on Public Instruction of 1878-79 will show that in one of the largest Aided Schools in this Presidency, the Town School of Kumbakonum, the fees covered the whole cost of the institution and left a considerable surplus.

7. The Committee again urge the abolition of the school classes of the Presidency College without attempting to meet any of the objections which have been shown to such a course. It seems unnecessary that I should go over this ground again, but I would point out that these extraordinary demands seem quite peculiar to this Presidency and were never heard of until the Central Institution of the Free Church of Scotland became a College. In Bombay there is the Elphinstone High School as well as the Elphinstone College, and this school is the most successful school in the whole Presidency. In Bengal the Presidency College has two Government Schools as feeders, viz., the Hindu school and the Hare School, and these are also the best schools in Calcutta. No measure could be more injurious to the Presidency College than the abolition of the school classes, and, considering the small scale on which the School Department is maintained, the pertinacity of attempts to get it abolished seems not a little remarkable.

8. The Managing Council of the Madras Christian College appealed in a Memorial dated the 3rd March 1879 against the reduction proposed to be made in the grant given to the School Department. The appeal was disposed of in G. O., No. 187, of the 20th May 1879, in which Government declined to interfere with the reduction. But the 12th August 1879 the Managing Council brought the question forward, and I submitted some further remarks on the subject in my letter, No. 4031, of the 30th September 1879, which was communicated to the Managing Council by Government on the 14th October 1879. The subject has been fully discussed, and I have nothing to add to my previous remarks.

9. The original estimate of the Memorialists was that the establishment of First Arts Classes in the Government Schools at Salem and Cuddalore involved an additional outlay on direct Government education of, in all likelihood, not less than Rs. 10,000 a-year. It has been shown that as yet no additional outlay has been incurred, two masters having been provided by a transfer and a reduction. Thus two districts have benefited and Government has been put to no additional expense. The Committee now say that the money, instead of having been applied to this purpose, might have been saved. They also observe that more masters will be necessary, and that when the development of the colleges is complete there will be an additional outlay of somewhere about Rs. 10,000. No attempt is made to explain how this enormous estimate is arrived at, and I can only say that whatever small further expenditure may be necessary will probably be met in the way in which such expenditure is usually met, viz., by reductions in fees. The Committee consider that the South Arcot and Salem Districts would be much better off without any colleges and that all that is necessary is the institution of a few scholarships. This of course is a matter of opinion. To the inhabitants of South Arcot and Salem it may seem strange that it should be right that Tanjore should have three colleges, Tinnevelly two, Vizagapatam [illegible] and Malabar two, and wrong for South Arcot and Salem to have each [illegible] already pointed out that the practice of the Missionary Societies with regard to the multiplication of colleges is entirely at variance with the theory propounded by the Memorialists and repeated by the Committee, but no attempt is made to account for this inconsistency. It seems scarcely worth while to give additional instances of this inconsistency, but it may not be out of place to observe that while it is now stated "there are few ways of spending money on education that do less good and more harm than the multiplication of small struggling colleges such as those at Salem and Cuddalore will always be," the London Missionaries proposed, in a letter addressed to Government on the 25th January 1879, that the Government School at Salem, which was at that time a Zillah School, should be abolished and that their own school should be constituted a college. The following is an extract from this letter.

"The London Mission High School is prepared to supply all the education—lower, middle, and upper—that is now supplied by the Zillah School and at lower rates to the scholars, thereby rendering the latter school totally unnecessary, provided that salary-grants be made to the lower department of the former school. The higher education would still be carried on without cost to Government.

"The London Mission High School is prepared to add a College Depart-

ment to its present establishment and to teach up to the F. A. standard if salary grants be made to the present High School. In this case the College Department would be carried on without cost to Government."

It will thus be seen that the Missionaries were perfectly willing to take the very step, of which, when taken by Government very shortly afterwards, they so highly disapprove. If they are sincere in what they say about the inexpediency of establishing a College at Salem, why did they make such a proposal?

With regard to the suggestion about scholarships, it may be stated that a system of district scholarships already exists, but it is on too small a scale to produce any great effect, and, if a large number of scholarships were given, it is by no means certain that the same amount of good would be done for the same money. It must also be remembered that boys sometimes matriculate at a very early age, and that it is often better that they should remain with their families until they reach the F. A. standard, than be once exposed for four years to the temptations and absence of restraint attendant on a four years' residence in a distant town.

10 The Committee are not satisfied with the construction placed on the Despatch of 1854 in G. O., No. 351, of the 15th September 1879, and consider that the position taken up by the Memorialists has not been understood. The Memorial, it is stated, pleaded the cause not of Mission, but of Aided Education. The Committee declare that they are as anxious for real neutrality on the part of Government as any one can be, and that they would strongly disapprove anything that would practically drive the children of unwilling parents into Mission Schools. It seems obvious that the Memorialists and the Committee are merely the representatives of certain class-interests, and that they have not the smallest right to the position which they now claim. As far as I know, in every case in which an attempt has been made to prevent a Government School being set on foot or to close an already-existing Government School, the movement has been a Missionary movement, and the object in view has been to reduce the inhabitants to one of the three dilemmas which I have mentioned, viz., to send their children to a Mission School, to establish a school of their own or to leave their children uneducated. No such attempt has ever been made by the Hindu or Mahomedan community in the interests of any secular Aided School. I have given several specific instances of Missionary interference in my former letter, and within the last twelvemonth there have been two more cases of the same kind. The London Missionaries of Salem proposed last January, as already mentioned, that the Zillah School should be abolished.

"The *Despatch of 1854*," they observed, "which forms the basis of all legislation respecting education in India, distinctly enunciates the principle that wherever practicable the higher education shall be left by Government to private enterprise, while Government efforts shall be restricted to the spread especially of lower-class education. As a private efficient High-class school now exists at Salem, there is no justification for a continuance of Government high-class education in that place."

A meeting was held at the Collector's Office, and the result shown that the native community were quite opposed to any such measure, which was also objectionable on other grounds. Government accordingly declined to close the Zillah School, but, if the application had been complied with, the inhabitants of Salem would have had no School except the Mission School to send their children to. The other case is that of Poonamallee. In 1873 the Church Missionary Society established a Middle-Class School at Poonamallee, at which place there was already a Taluq School. Several of the leading inhabitants sent in petitions against the Mission School expressing their apprehensions that the result might be the eventual closing of the Taluq School and praying that the Mission School might be

abolished. The late Director of course stated that he could not interfere in the matter, but that, as Poonamallee was not a large enough place to maintain two Middle-class Schools, it would probably be his duty to refuse a grant in the event of any application being made for one. This was in October 1874. On the 18th September 1879 Mr. Arden, Secretary of the Church Missionary Society, requested me in the following letter to close the Government School and to give the Mission School a grant:—

"I beg to bring the following subject to your notice:—There is at the present time a Government School at Poonamallee and a School belonging to the Church Missionary Society. The place seems hardly large enough for two schools, and the Church Missionary Society do not feel able to carry on the school unless a Government grant can be given, which is at present refused, I believe, on the ground that there is a Government School in the place.

"It may be said that the Mission School was opened after the Government School and that therefore it ought to withdraw. I fully allow the soundness of the argument were it not the definite policy laid down by Government in their Despatch of 1854 that Government Schools were gradually to give way to, and be replaced by, Grant-in-aid Schools. This being the case, it seems to presuppose and encourage Aided Schools being established to the displacement of Government Schools.

"It may be further said, 'When there are places without any schools, why should the Church Missionary Society establish a school in a place like Poonamallee, where a Government School is already in existence?' To this I reply that the number of our Missionaries and Mission agents are limited, and they are definitely confined to certain limits. Hence it is only possible for them to have schools in certain particular localities. As Government Schools are not thus confined to certain localities, the agents advisable that may for such schools to be removed to places which cannot be supplied by Grant-in-aid Schools.

"The present state of the two schools plainly shows that the Mission School is not unacceptable to the people.

"In the end of August there were in the Mission School 75 boys, and in the Government school 53 boys.

"I am informed that in the Government School there is a first class (A and B), though, if I am not mistaken, this is not according to Government Rules for Taluk Schools.

"I do not wish to press the matter, but simply desire to know for my guidance, as Secretary of the Church Missionary Society, what the declared policy of the Educational Department is in such matters.

"If the Government School is not closed, and a grant given (out of the money thus saved) to the Mission School, the Church Missionary Society will be obliged to close their school and withdraw. I therefore await your decision in the matter, and request the favor of an early reply."

Both these recent cases show, I think, how little the action of the Missionary bodies represented by the Committee is in accordance with their professions and that, whatever the Committee may say, the substitution of Mission for Government Institutions, without any reference to the wishes of the inhabitants, is one of the main objects which the Missionary Societies are aiming at.

11. The Committee state that the main object of the Memorial would be granted if an effort were made to transfer the management of Government Schools and Colleges to local committees of native gentlemen, even though not a single Mission Institution received any direct benefit from the change, and they name certain colleges and schools as showing how successfully native gentlemen can manage such institutions. The Colleges at Trivandrum and Ernaculum are not Aided Institutions managed by committees of native gentlemen. They are State Institutions, and I be-

lieve that their management is mainly entrusted to European gentlemen. The following account of the Vizianagram College is extracted from the University Calendar for 1878-79 :—"The Inspector of Schools of the First Division is entrusted by the Maharajah with the general management of the institution and it is conducted in all respects as a Government Provincial School." The European element enters, I believe, largely into the management of the Coimbatore and Virugapatam Colleges. A few of the other institutions named are very successfully conducted by native gentlemen, but the management of several of those specified has been anything but satisfactory. The state of the Central School of Nuzzapur is described at page 48 of the Report on Public Instruction for 1878-79, from which the following extract is taken :—

"The Central School of Nuzzapur was inspected by Mr. Bradshaw in October. 'This school,' he observes, 'seemed to me, and still seems, the embodiment of all the defects which have been pointed out by my predecessor and myself as being noticeable more or less in different schools. There is scarcely a deprecatory sentence in any of my reports which was not applicable to this school at the time of my visit.'

"As this state of things had existed for several years, it was evident that some decided steps were necessary. The grants of the assistant masters were accordingly suspended, and the Head Master, who, by the peculiar arrangement which prevails in this school, is a Government servant, was informed that he would be removed to another school. I visited the school myself in February, but found that even then no steps had been taken by the managers to replace any of the inefficient assistant masters. In fact the staff was more inefficient than ever, as, owing to the death of one of the assistant masters, two men junior to him had been [illegible] of higher classes than they were before, and a boy who had failed in the Matriculation Examination had been made an acting assistant master. The school was not furnished with any apparatus for teaching physics, the maps had not been renewed for many years no additions had been made to the school library for twelve years, and no use was made by the boys of the library because there were no books in it suited to their capacity. The curriculum was very defective. The Head Master stated that it had been prescribed by the Committee, but the President did not admit the existence of any such order. A meeting was held at which the managers agreed to adopt various measures proposed by me for placing the school on a more efficient footing."

I may add that I found that several of the native gentlemen who constituted the Committee were persons ignorant of English and therefore unfit to be entrusted with the management of an English School. This state of things prevails extensively in English Schools under native management. In the Hindu School of Bezváda the result of Mr. Fortoy's inspection was so unsatisfactory that the Head Master's grant was suspended (*vide* page 69 of the same report). A special report on the Hindu Proprietary School was submitted to Government in my letter, No. 2007, of the 14th May 1879, and it was shown that the teaching was unsound and the staff a very poor one, and that altogether the institution was unlikely to fulfil the purposes for which it was originally established. An unfavourable account of this school is also given at page 47 of the Report on Public Instruction for 1878-79. The Hindu Anglo-Vernacular School in Triplicane was inspected by Mr. Fowler in July 1879, and the following is a copy of my Proceedings reviewing his report :—

"This report relates to an inspection of the Triplicane Anglo-Vernacular School held in July 1879, the last previous inspection having taken place in March 1879.

"The attention of the managers was drawn in the Director's Proceedings, No. 1793, of the 3rd May 1879, to the unsound character of much of

the teaching which was going on in this school, and it was pointed out that to work a large High School of this kind successfully a staff would be required of four graduates, four First Arts men, and three matriculates.

"The only changes which have been made are the following :—A Graduate has taken the place of a First Arts man as Head Master at a reduced cost to the managers of Rs. 5 per mensem, and a Matriculate named T. Kristna Rau, who was receiving Rs. 7 per mensem, has left the institution. The managers have therefore reduced their expenditure by Rs. 12 per mensem and their staff by one man. The present staff consists of two graduates, two First Arts men, four matriculates, three fifth-grade men, and one man who has passed no examination.

"The report shows that the classes are still below their nominal standard, that many of the boys are in classes for which they are utterly unfit, and that the teaching is of the same unsound character as before. The last report of the Syndicate shows that out of fifteen boys who went up for the Matriculation Examination from this school not one passed.

"A High School of this character in a town like Madras does harm instead of good, as the pupils might obtain a sound education elsewhere, whereas here they are wasting their time and money.

"Large reductions have been recently made in the grants of certain schools mainly on the ground that schools are rapidly becoming more or less self-supporting, and that in some instances in which the Government grants and fees have exceeded the expenditure profits have been made.

"From this report it appears that the receipts are greatly in excess of the expenditure, and that it is not from any want of funds that the staff is maintained on its present inefficient footing. The Director of Public Instruction considers it undesirable to allow this state of things to continue, but, before taking any measures for withdrawing or reducing the grant, he will await any explanation which the managers may wish to offer, as regards the past administration of this institution, or any proposals which they may wish to make with regard to its future status."

I confine myself to these cases because these schools are specially singled out by the Committee as models for imitation. If native gentlemen do not generally set up schools in opposition to Government Schools, it is probably because they are satisfied with the system on which these schools are worked. They are no doubt aware that as a general rule Government Schools are much more efficient than Aided Schools, whether Missionary or Secular. This is sufficiently evident from the relative success of these two classes of institutions in the Matriculation Examination, as will be seen from the following table taken from the Public Instruction Report for 1878-79, page 26. It will be observed that 45 per cent., of the candidates sent up from the Madras Government Schools in 1877-78 passed, while only 33 per cent. passed from Aided Schools. In 1878-79 the examination was unusually severe, and the percentage in the Madras Government Schools fell to 23 and in Madras Schools under inspection to 12.

Institutions.	Percentage of Successful Candidates.	
	1877-78.	1878-79.
Madras Government Schools...	45	23
Government Schools in Native States	34	19
Madras Schools under Inspection	33	12
Other Private Institutions	25	9
Private Study	13	2

If the few Government Colleges and Schools which exist in this Presidency were made over to the management of local committees of native gentlemen, the inevitable effect would be a general lowering of the standard of education. Such a measure would probably be favorable to Missionary

enterprise, for it would reduce all Schools to the level of the Mission Schools, and it would be easier for Mission Schools to compete with Hindu Schools than with Government Schools, but it would be disastrous to the cause of sound learning. The Annual Reports on Public Instruction show the unsound character of much of the teaching which goes on in Aided Schools generally, but I beg to draw special attention to some of the details given in the report for 1878-79.

12. The Secretary submits with the remarks of the Committee certain resolutions of the Bangalore Missionary Conference appointing the Committee. In the first of these resolutions it is stated that the Conference approves generally of the Memorial and expresses its decided opinion that the matter should, if necessary, be carried to the highest authority. It is therefore probable that the whole question will go before the Secretary of State for India. As the Committee state that the Memorial pleaded the cause, not of Mission, but of Aided Education, and as they profess to explain the motive which has hitherto prevented native gentlemen from starting schools in opposition to Government Schools and to vouch for what they will do, if they receive proper encouragement from this Department, Government may see fit to allow a few leading representatives of the Hindu and Mahomedan communities an opportunity of stating whether they wish the Executive Missionary Education Committee to be accepted as the exponent of their views on this and future occasions, and of recording, if necessary, their own opinions on the questions raised by the Memorialists and the Committee. The following list of names is submitted for the consideration of Government:—

His Highness Rama Varma, First Prince of Travancore.	M. R. Ry. T. Gopala Row, Rao Bahadur, B.A.
Raja Sir T. Madhava Rau, K.C.S.I.	,, P. Chentsal Rau.
The Hon. T. Muttusami Aiyar, B.C., C.I.E.	,, P. Ramiengar Rau.
,, Mir Humayun Jah Bahadur, C.I.E.	,, Y. Venkataramiah Sastri.
,, V. Ramiengar, C.S.I.	,, V. Krishnama Chariar.
,, A. Seshayya Sastriyar, C.S.I.	,, P. Runganadha Moodelliar, M.A.
M. R. Ry. R. Raghoonath Row.	,, V. Bashyem Iyengar, B.A., B.L.
,, C. Rungacharlu, C.I.E.	,, A. L. Venkataramana Punt, M.A., B.L.
,, C. Runganatha Sastri.	Abdoor Razzak Sahib.

No. 15. ORDER THEREON, 13th March 1880, No. 80.

Recorded.—The letter from the Director, with that from the Secretary to the Missionary Committee, will be communicated to the Secretary of State with Despatch, dated 13th March 1880, No. 2.

(True Extract.)

E. GIBSON,
Acting Under Secy. to Govt.

MISCELLANEOUS.

Educated Adventurers in France.—The annual distributions of prizes to schoolboys have recently taken place with the usual pomp all over France, and many distinguished persons who presided over these solemnities have congratulated the country on the perceptible spread of education among us. At first sight it seems good that the national reproach of ignorance which has so often been levelled at Frenchmen should be disappearing. But on consideration, it will be seen that the present system of education in France tends chiefly to rear an enormous class of over-instructed young men, who are ashamed to beg, too proud to dig, but who yet can find no remunerative occupation for themselves. There is too wide a gulf in this country between the education in the primary and in the secondary schools. In the former pupils are just taught to read, write, and reckon badly; in the latter, that is to say in the lycées, instruction is pushed as far as may be, insomuch that when a peasant's son who has distinguished himself in his village school gets a bourse, or scholarship, which carries him to the lycée, he leaves it the equal in instruction of any rich man's son. But what after that? It appears from statistics that some 80,000 young men leave the lycées and universities yearly to go forth into the world, and that five-eighths of these are dependent on their own exertions for their subsistence. The Ecole Polytechnique provides annually for 150 of them, whom it converts into State engineers and artillery officers; the School of St. Cyr endows another 150 with commissions in the cavalry and infantry. About 400 go into the Church; 300 into the professoriate; while 3,000 more, at most, succeed in winning appointments in the Civil Service, principally through the diligent intriguing of their friends. There remain then, in round numbers, rather more than 45,000 youths who must try their luck as doctors, advocates, commercial clerks, private tutors, actors, or tradesmen. Say that 25,000 among these succeed somehow. Among the number will be men who go in for army commissions by serving a long apprenticeship as private soldiers; others who, having the good sense to accept any position which offers itself, will waive their pretensions and sink into the position of petty tradesmen; and there will be others again who will manage to get on in life by marrying girls with some money. But there are 20,000 still to be accounted for, and these will become adventurers, and, what is worse, they will be stay-at-home adventurers. It would not matter much that so large a number of educated young men should be thrown as foragers upon the world if France had many colonies, or, to speak more correctly, if the present race of Frenchmen had a taste for emigration. There is room for a good many adventurers in Algeria; but the French, who used once to be such excellent colonizers, have, owing to the alterations which the Revolution introduced into their social system, become disinclined to leave their native country; and they will starve at home, on the chance of something "turning up," sooner than go far afield to look for their bread. The dream of every young Frenchman whose pockets are empty is to marry a girl who has from £2,000 to £4,000 and to earn about £200 a year for himself by means of a situation affording a fixed salary. It is not an extravagant dream, and to do the Frenchman justice he is quite happy if he realises it. Having got £300 or £400 a year, he does not seek to enlarge his income, but lives prudently within his means, and invests some savings every year with commendable judgment. The very fact, however, that so many Frenchmen should pitch their ambition so low as to require nothing more than what an Englishman would call a little competency shows how keen the struggle for life there is; and when one reflects that the thousands of men who covet the position of *petit rentier* are joined annually by 20,000 young recruits fresh from the schools, and with all their talents whetted according to the

newest systems for the social fray, one cannot wonder at the large numbe of educated young men who find their way into gaols. The last annu report of the Ministry of Justice dwells upon the increasing number c well-educated persons who are imprisoned for offences against property M. Victor Hugo and his friends, who used to laud education as the panace for all social and political ills, may find this a hard fact to digest, but ther it lies; and one may add that for determination in offences against life, a well as in swindling, the highly trained young men, who have been throug the best lycées, are quite equal to the uncultured rough. Every paid pos in France is so keenly coveted that a vacancy will draw hundreds of appl cants, and statesmen who are always talking about the necessity for dis missing superfluous employés find themselves reluctantly compelled to ad to their number every year because they are overawed by the mass c candidates. As regards the engineering branches, for instance, the numbe of young men who qualify every year for the post of Government enginee exceeds by several hundreds the number of places to be disposed of; bu to allay disappointment as far as possible the Government goes on multi plying situations, thereby creating a body of civil servants who have no enough to live on, and who grow discontented from seeing all chances o promotion stopped. In this country discontent with the Government soon develops into a seditious spirit, and it may safely be said that every office holder who is dissatisfied with his position is a revolutionist *in posse*. Bu much more so is this the case with the adventurous young men who have not succeeded in getting any office at all; so that one may conclude the present system of education in France leads to the creation of an annually increasing body of citizens whose profession will be to war on society, and who, politically speaking, will be ready for anything.—*Pall Mall Gazette.*

APPOINTMENTS.

Appointments made by the Director of Public Instruction between the 16th April and 15th May 1880.

A. Subba Row, to be Head Master *substantive pro tem*, Cannanore High School, on Rs. 90.

M. Ramasamy Iyer, to be 2nd Master *substantive pro tem*, Cannanore High School, on Rs. 50.

G. S. Abboy Naidu, Deputy Inspector of Schools, Hosur Circle to act as Deputy Inspector of Schools, Vellore Circle.

S. Atchayalinga Mudaliar, Deputy Inspector of Schools, Vellore, to act as Deputy Inspector, Hosur Circle.

Gundikota Dikshibula, to be Head Master *substantive pro tem*, Middle School, Bimlipatam, on Rs. 40, per mensem.

V. Advaithabrahma Sastry, 2nd Master Middle School, Amalapur, to be Head Master *substantive pro tem*, Middle School, Ankapully, on Rs. 40.

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THE MONTH.

Mr. GARTHWAITE the Inspector of the Sixth Division shortly goes home on furlough, and we learn that Mr. James Bradshaw of the Civil Engineering College is to act for him. Mr. Kenny of Berhampore College, report says is to act for Mr. Bradshaw, Mr. Scott of the Cuddalore College is to act for Mr. Kenny, and Mr. Elliott of Kurnool is to act for Mr. Scott. Mr. Burroughs, Acting Headmaster at Saidapet also goes home immediately on sick leave.

WE are sorry to learn that it is probable that for the second time injustice is likely to be done to the Educational Department in appointing an outsider to the Directorship. It is rumoured that the new Director is to be brought out straight from England. For a long time past, Mr. Thompson, the Principal of the Presidency College has been marked out by the almost universal opinion of the Department as the most fitting man for the appointment, and his present position and former services would seem to entitle him to it. There is no man who has had better opportunities of studying the aspects and needs of Education in this Presidency than Mr. Thompson. It is indeed a question whether a departmental Director is really needed, and whether the funds set apart for Education by Government would not be more economically and more impartially

administered by one of the Under Secretaries to Government untrammelled by the traditions of the department, and inheriting none of its prejudices; but if a Director is to be again appointed, a variety of circumstances combine to point out the selection of Mr. Thompson as the most fitting that could be made.

We have received a copy of Mr. Barrow's Notes on Collins' Cicero.* In the preface we are told that these Notes were originally written for Mr. Barrow's own pupils in the F.A. Examination of 1877, though not published. 'Cicero'—one of the very best books of the series to which it belongs—having been again prescribed for the First in Arts Examination, it is thought that the notes, with some additions, may prove generally useful to students.

Something, as the annotator informs us, has been left students to do for themselves, but all real difficulties of allusion or language he has done his best to elucidate. As most good College Libraries possess Webster's, Smith's, Haydn's, Brande's, Brewer's, and Beeton's Dictionaries, students are referred to them for additional information; and wherever it has seemed likely that non-classical students would have any difficulty, he has given references to the articles they should look under.

These notes will be most valuable to Hindu students, who as a rule, have little or no knowledge of the Latin classics. The book is well and carefully printed with but few misprints for an Indian publication. The notes too are careful and accurate, but *quandoque bonus dormitat Homerus*, and since the publication of the booklet, Mr. Barrow in the note on the "*Floral Oriental type*," (Chapter VII, 9) has caught himself napping. He says in a letter to us

> "The text is here [illegible] of the style of declamation of 'oratory,' and of the oriental style of writing. All that students need do is to put their pens through that note. How such a stupid blunder crept in, I cannot say. I detected it at once in class teaching."

We ourselves have had some little experience in annotating, and if this is the only mistake, (and we have discovered no other), in about 50 pages of notes, we con-

* NOTES ON COLLINS' CICERO, (Ancient Classics for English Readers). By Cecil M. Barrow, B.A., Oxon, Principal, Kerala Vidyasala, Calicut. Madras, Addison and Co., Mount Road.

gratulate Mr. Barrow, for we well know how often at the first blush a passage or a phrase presents itself in a wrong light, and when once the erroneous idea has taken possession of the mind, it is often hard to disabuse oneself of it.

NOTICE.—Candidates for the ensuing University Examinations, wishing to be exempted from producing Certificates of Attendance, must send their applications, stating the grounds on which they claim exemption, to the Registrar *not earlier than* the 1st nor later than the 31st of July 1880.

ALTERATION OF BYE-LAWS.

The following changes have been made in the Bye-laws of the University of Madras:—

Bye-law 136.—*Omit* the note.

Do. 142.—*Omit* "2 to 5, Latin 100, an examination up to the F.A. Standard for Candidates who have not passed in Latin at the F.A. Examination;" omit also the note.

Bye-law 144.—*For* the present bye-law, *read* "Candidates failing to obtain one-third of the marks in each subject, or one-half of the aggregate number, shall not pass."

Bye-law 145.—Tabular statement. *Omit* "Latin 100." *For* total number of marks obtained "350" *read* "250."

Bye-law 37, iv (c)—

For Physical Geography—Professor Geikie's Physical Geography.

Read Chemistry by Professor Roscoe to the end of Art. 52. [Questions of an arithmetical character are, as far as possible, to be excluded from the papers on Chemistry and Physics.]

Bye-law 56.—Second day 2—5—

For Physiology	50
Read Physiology	70

Bye-law 61.—*Form of Statement to be submitted by the Tabulator:*—

For Physiology	50
Read Physiology	70
For total number of marks obtained.....	540
Read do. do.	560

This change will come into operation in December 1880.

ERRATUM.—*Languages—Matriculation Examination, 1881.*

On page 805, April 13th 1880, Part II of *Fort St. George Gazette*.

For "Bharata Venka—First 100 Stanzas,"

Read "Bharata Venka—100 Stanzas from 355."

STANDING ORDERS.—Several important changes have taken place since the first edition of the Standing Orders was published in 1878. The nomenclature of Colleges and Schools has been altered. New forms of statistical *returns* have been prescribed. Examinations styled the Middle School and the Upper and Lower Primary School examinations have been instituted and promotions have been made to depend on the result of these examinations. Several important changes have been made in the organization of Normal Schools, and their working has been affected by the passing of a new Educational Grant-in-Aid Code. The new series of English and Vernacular Readers

is approaching completion. Dr. Cunningham's Sanitary Primer and Mr. Robertson's Agricultural Class Book have appeared. The Physical Science course for the Matriculation examination has been changed. The standard of several institutions has been raised; and a scheme for remodelling the establishments of all second Grade Colleges and First Grade High Schools has been recently sanctioned. The School Fee Fund has been abolished and various other minor reforms have been carried out.

These changes have been embodied in a new edition of the Standing Orders, which will be available for issue in a few days. It will be sold in the same way as all text-books are sold at the Book Depots. The book is primarily intended for Government Schools and every District Curator will reserve a sufficient number of copies to admit of every Deputy Inspector and every Master being supplied with a copy. The remaining portion of the supply sent may be sold to the Local Fund Boards, Municipalities and Managers of Aided Schools.

PROMOTION IN GOVERNMENT SCHOOLS.

The following instructions are issued with reference to the schemes sanctioned in G. O., of 18th May 1880, No. 169, *for remodelling* 2nd Grade Colleges and 1st Grade High Schools.

When a vacancy occurs in a High School, Middle School, or Normal School, which can be filled by transferring some First Arts man already employed in a College, without subjecting the person transferred to any loss of pay, the transfer should be made by the Inspector if the appointment is one which rests with him, or it should be recommended for the Director's sanction if the appointment rests with the Director. Thus, if a First Arts master in a College is drawing Rs. 30 and the Headmastership of a third grade Middle school becomes vacant, the Inspector should transfer the man. If a First Arts Master is drawing Rs. 40 and the Headmastership of a second grade Middle school becomes vacant, the transfer should be recommended for the Director's sanction.

When the vacancy cannot be filled up by transferring a First Arts man from some College in the same division, the Inspector must ascertain from the other Inspectors whether the vacancy can be filled by transferring some First Arts man from some College in the other divisions.

The effect of the transfer may be to create a vacancy for a graduate, or to leave the lowest class or section of a class without a teacher. In the former case, application must be made to the Director for the Appointment of a graduate if the salary is one exceeding Rs. 30. If, on the other hand, the number of Masters is merely brought down to its proper strength, or is brought one nearer to its proper strength, the class will be abolished as a Government class, but it may be placed under a Master, who will receive no remuneration except the fees of his pupils.

Similarly, when a vacancy occurs in a Middle School or Normal School which can be filled by transferring a Matriculate from some College or High School in the Inspector's own division or in some other division, the transfer will be made in the same manner.

In this way all First Arts men and Matriculates will be gradually removed from Colleges and all Matriculates from High Schools, except Mahomedan Masters, Oriya Masters, Sanscrit and Vernacular Pundits, and Writing Masters, until all the men who are to be removed have been absorbed in this way, no fresh appointments should be made, but such First Arts men and Matriculates as are now under training with provisional appointments will be treated as if they had actually entered on their duties and will be transferred as opportunities occur.

From this date no First Arts man or Matriculate will receive any further promotion in a College, and no Matriculate will receive any further promotion in a High School.

The Inspectors are requested to furnish a list of Masters in Colleges and High Schools who have to be absorbed. This list will be published, and until all have been absorbed a list will be published monthly showing those who still remain to be provided with other appointments.

The Principal of the Madras Normal School is requested to admit no First Arts men or Matriculates to be trained for any posts in Government Schools until further notice.

In all Colleges and High Schools in which gymnasia have not yet been established, immediate arrangements should be made by the Inspectors for the appointment of a gymnastic Instructor. A fee of one anna per mensem will be levied from the pupils of every class.

Sanscrit is now taught at Bellary, Mangalore, and Berhampore. The Director trusts that it will be found practicable to introduce it into every College and High School.

At Bellary, the Moochee should be restored to a Peon and one of the Peons to a night watchman. Peons in various schools who are now receiving Rs. 5 or 5 8-0 will have their pay raised to Rs. 6.

The following remarks on the work of Inspectors we take from an English contemporary :—

> "The proper inspection and examination of an elementary school is a matter of no slight difficulty. Rightly to appraise a year's work in the short time at the disposal of an inspector requires a great amount of tact, judgment, and knowledge. The inspector owes a duty to the children, teachers and managers, and also to the Department through which the nation gives grants for the encouragement of popular education. The inspector who fills his office with pleasure to the teachers and satisfaction to the Government is worthy of all honour, and we always record with much gratification all examples which come to our notice. Mr. Graves, we are told, has so successfully accomplished his task as to win the esteem and appreciation of the teachers, and at the same time to receive the favour of the Department in being promoted to the chief charge of so important a district as Huddersfield. We are glad that Mr. Graves has afforded another example that a proper and conscientious performance of an inspector's duty towards the Department is not incompatible with kindly interest and hearty sympathy with the teachers' work and aspirations. How is it that so many inspectors fail to realise this? The want of experience, judgment, and sympathy makes some inspectors a terror to children, teacher, and managers, mars their work, and retards rather than stimulates education in the districts."

The Religious Tract and Book Society have decided on publishing for educated Hindus a Monthly periodical in English under the title of PROGRESS.

The leading contents will be as follows :—

1. Papers on India, giving the results of inquiries into its history, ancient literature, antiquities, &c. An intelligent knowledge of our native land, is one means of promoting our interest in its welfare.

2. Descriptions of foreign countries. Macaulay says, "The importance of geography is very great. Indeed, I am not sure that it is not of all studies that which is most likely to open the mind of a native of India." Instead of keeping jealously apart, India should mix with the great family of nations. At a meeting of the Social Science Congress in England, the late Sir Mutta Coomaraswamy, of Ceylon, expressed a hope that the time would come when, "a Hindu crew, commanded by a Hindu captain, should steam into New York or London, in a steamer built by Hindus in Bonbay or Calcutta."

3. Lessons from biography and history, showing that the "pursuit of knowledge under difficulties' is possible, and how men of the humblest origin may benefit the whole human race.

4. Accounts of discoveries in science, and inventions in the arts.

5. Brief notices of public events.

6. Hints on self-culture, both to students and others who wish to improve their minds.

7. The advocacy of sanitary, social, and moral reform.

Lastly, articles on the religious questions chiefly agitated in India at the present day, and counsels to inquirers after truth and righteousness.

GIRLS' SCHOOLS.—Public attention has not been withdrawn from the subject of brain-pressure in educational matters. Mrs. Garrett-Anderson delivered a lecture to the members of the Social Science Association, in which she dealt chiefly with the question as it affected the best secondary schools for girls. After discussion the medical aspects of the matter, and the division of responsibility which lay between mother and mistress, the lecturer made the following suggestions:—(1) To get the elements of knowledge well and thoroughly taught at an early age, and not to urge the child to make up for early neglect by taking a very extensive range of subjects as soon as she goes to a good school; (2) to accept two and a half or three hours of class work as long enough at one time for almost all children, and to provide two or three short intervals of rest—*e.g.*, five minutes or ten minutes in each hour—during even this time; (3) to insist upon every girl's school having a playground; (4) to aim at greatly reducing the amount of writing in the home work; (5) to reduce the number of examinations, and especially to make them as unstimulating as possible, and to apply them with great reserve to the children most likely to shine in them; and (6) not to aim at completing the education by the age of eighteen. The main purpose of Girton and Newnham Colleges was to encourage young women to continue their education in an organized manner after they cease to need the restraints imposed upon school-girls, and the existence of these colleges rendered it more than ever unnecessary to attempt to teach girls everything they ought to know in early adolescence. These suggestions are all sensible and to the point. Any blame as to the matter of over-pressure must be placed to the account of the parents, the public as a whole, and the demands under the various examination schemes of the period. If parents require their children to pass a given ordeal, the teacher must do her best to secure success. Credit is at stake, and competition acts as a spur to excitement in the race of both teachers and taught.

Some of the suggestions which have been made by Mrs. Garrett-Anderson are applicable to all schools, and none know that fact better than teachers themselves. It is a good thing that the public have apparently become interested in this subject on their own account. It is well to work hard and steadily for Mr. Fitch's experiences will be that of others. In the course of the discussion he declared that, as the result of his experience, he had found the greatest amount of health, cheerfulness, and happiness existing among pupils in schools where the intellectual aims and the instruction given were the highest. That may be quite true, where examinations are not superadded in excess, and where an unhealthy stimulus is not applied in vain searching after too great a degree of excellence. Educational work will ever continue to do less harm than educational worry.—*The Schoolmaster.*

TEACHING OF ETYMOLOGY.—"After completing my examination of the papers which I looked over I was impressed by the character of the etymology and thought it well to send the headmaster a short note or minute on the subject. When Professor Selby's report came into my hands I found that he also had been led to almost identically the same criticism by the examination of his papers. I further find that the same criticism has been made by previous examiners, and I therefore have considerable confidence in suggesting that the existing mode of teaching English etymology in the Poona High School might with advantage be radically changed. At present the boys are taught that a given English word "comes from" another word also given, which is said to be Latin or Greek. Few boys usually know Latin or Greek; and the intermediate forms through which the modern English word is derived from the (assumed) original are not mentioned; nor is the connection in meaning pointed out *e.g.* I was told by many boys that scandal comes from the Greek *scandalo* (often *scandolos*) which comes from the Latin *skazo*, I slip! I venture to suggest that all such etymology is useless, and that it would be far better to omit all mention of the words in Greek, Latin, or other unknown tongues; *e.g.* I would tell boys that squirrel is derived from a word which means shadow-tail and I would not mention the actual Greek word or the succession of Latin, Romance-Latin and French words through which skiouros has become squirrel. I believe much time is worse than wasted in learning by rote manuals of etymology, and that it would be wise to prohibit teachers often ignorant of Latin and Greek themselves to mention any Greek or Latin words at all as the origins of English words. Let the teacher explain to the utmost of his knowledge how the English word derives its present meaning from an original with an apparently different meaning. This would interest boys and be sound teaching, but let him discourage the use of manuals of etymology and all learning by rote of words not understood. Dr. Kielhorn concurs with me in this suggestion."—*Principal Oxenham of Deccan College.*

LORD GEORGE HAMILTON while presiding last month at the distribution of prizes and certificates at the College of Preceptors, London,

told the following amusing story of his experience as a casual inspector of an Irish Primary School :—

"I some years ago attempted, in rather a crack Irish elementary school, to examine one boy in mental arithmetic. I put the question to him, "Suppose I give you 1*d.* a day for five years, what would it amount to?" The boy in almost an instant calculated it, and as I thought he was 1*d.* wrong in his answer, I said, "No, you are wrong." He said, "No, I am quite right." I took my pencil out and I said, "You are 1*d.* wrong." He said, "Shure, your honour's forgot there's leap-year." It is true I had not made allowance for the fact; the laugh was turned against the examiner, and never since that time have I had the courage to examine."

His Lordship no doubt acted most sensibly in at once admitting his error, as in his question he evidently meant five consecutive calendar years and forgot that there might be one or even two leap-years in that period. A man too proud to own to a mistake would probably have tried to save himself by pointing out with an air of superior wisdom that the question as it stood admitted of three correct answers, and that the boy should have given all three." But he would have been despised by the boy.—*Educational Record, Bombay.*

It is never too late to learn. It would seem that in China the work of learning and examination goes on much longer than among ourselves. We read in an English paper:—"The extraordinary persistency with which unsuccessful candidates present themselves year after year at the Chinese competitive examinations is curiously illustrated by certain edicts in the *Peking Gazette* of last year, in which honorary degrees are conferred on forty-two candidates who are finally plucked at the age of ninety and upwards, and 136 who gave up the struggle when between eighty and ninety." It would be, indeed, a sorry sight to see an old man of ninety tottering up to the examiner's desk. The aged scholar like the ancient minstrel, might well consider his departed companion in the race, and "long to be with them and at rest."

It affords us great pleasure to be able to announce that the Lieutenant-Governor has been pleased to cancel the sentence of death passed upon the Berhampore College by the Director of Public Instruction. Not only has Sir Ashley Eden consented to continue the College but has also promised to send a European Principal to it to teach English. The people of Moorshedabad will no doubt raise loud hosannas to the praise of Sir Ashley for this act of grace, but we hope they will do something more. The Berhamporo College has no B.A. classes, but why should not the great zemindars and other opulent persons in the district come forward and found these classes? Raja Promothonath Roy of Digapatty has paid about a lakh and a half of rupees for the Rajshye College. The people of Krishnaghur raised Rupees 40,000 for their College, one-eighth of which, however, came from Maharani Shurnomoye. Will not the Maharani, whose liberality has passed into a proverb, open her purse-strings for the benefit of her own district? She alone, if so disposed, can make an endowment enough for the

maintenance of the B.A. classes. But there are others who are well able to second her benevolent efforts. We hope our hint will not be thrown away.—*Hindoo Patriot.*

Increase of School-Fees.—The Managers of some of the Aided Schools in Madras think that the time has come when the scale of fees might again be revised with a view to raising them in at least some of the classes.

This can only be done by Government raising the minimum scale now in force. As the recent reductions in the Government grants have thrown an additional burden on the Managers of schools there are grounds for expecting that Government will not be unwilling to do this if it can be done without injury to the spread of education.

Should general opinion be in favour of an increase the Association of Madras School Managers and Principals will probably ask Government to re-appoint the Fee Committee that considered this matter some years ago.

An Indian Institute at Oxford is a project which has now for many years been diligently advocated, and which deserves to be crowned at last with success. Its chief promoter has been the Boden, Professor of Sanskrit at Oxford, Dr. Monier Williams, upon whom, for his efforts on behalf of Indian students and study, the honour of the Order of the Indian Empire has just been so properly conferred. Both in this country and in India that distinguished scholar has toiled hard for the cause he has at heart, and the announcement of the formation of a working committee, which is how made, goes to show that he has not laboured in vain. This committee includes many eminent men in science, the State, and the Church, and both the rank and the wealth of the country are amply represented on it; while the subscription list amounts already to sixteen thousand pounds. At the head of the long roll stands the honoured name of her Majesty the Queen, and after her come three of our Royal Princes. Then the catalogue of subscribers runs brilliantly on through Viceroys—past, present, and future—Eastern Maharajas, and London Livery Companies, a score of "Highnesses" and several Excellencies, a perfect wilderness of M.P.'s—some, alas! M.P. no longer—Bishops and Earls, Generals and Deans, Dukes and Nawabs. Every grade of nobility, in fact, and every step in the hierarchy of the Church as well, is substantially represented in the list while among the commoners in it the orders of honour and degrees of science are plentifully scattered, and there are millionnaires not a few. How is it that, with such a muster of such friends, the Indian Institute at Oxford has not already come into solid existence? With several Barings, a Brassey or two, a Burdett-Coutts, and a Duke of Westminster all co-operating in the work, a dozen Institutes might have been expected to spring up full blown, and when we find added to the number the names of the great public benefactors and millionnaires of India, the Peabodies and Rothschilds of our Eastern Empire, the surprise becomes even greater. Her Highness the Maharani Surnamoya, "the Lady Burdett-Coutts of Bengal," and the munificent Dacca and Burdwan families are among the subscribers, and so, too, are the Readymoneys

and the Sassoons, and other princely and public-spirited members o the Bombay plutocracy. Such a combination of wealth might surel do anything; but the individuals and families we have enumerate do not exhaust a tithe of the Boden Professor's clients, for he ha placed under tribute not only the civic Companies and the differen services, British Royalty, nobility, and the whole Bench of Bishops, both Houses of Parliament, and all the leading firms engaged in Anglo-Indian commerce, but has also taken toll from many of the great feudatories of India. The Maharajas of Cashmere and Patiala, the Nizam of Hyderabad and the Gaekwar of Baroda, picked at random from the list, give at once a striking idea of the wide range over which the sympathy of native gentlemen has been canvassed, and the whole together go to show that Calcutta, Madras, and Bombay have all alike been enlisted in the cause, and that the Indian Institute has been abroad gathering friends in every province of India from Afghanistan to the sea.

The work of education is making steady progress in Cochin under the Maharajah's government. In Cochin there is a High School and College with an attendance of about three hundred pupils, and there are district schools which are supervised by the Principal of the College who is a sort of Director of Public Instruction in the province. Of the students who attend the college fifty are Brahmins 87 Roman Catholics and 83 Sudras. There is a falling off in the number of Brahmin boys. The Madras Director of Public Instruction having placed certain scholarships in the Normal School at the disposal of the Principal of the College, four students were sent to Madras and after they qualify and pass out, appointments will be provided for them in Cochin. There is a book depôt in connection with the department, the sales of books were valued at Rs. 391 for 2,584 volumes. The district schools were visited by Mr. Sealy who offered certain suggestions to the Government for their improvement. These will receive early consideration. The Vernacular schools in Cochin are not doing well, the attendance of the pupils has somewhat declined and with about one hundred and forty boys on the roll much cannot be done. Vernacular classes have been opened in all the district schools. The complaint everywhere is that the Hindu boys take more to the acquirement of English than their own language and this is amply borne out by the returns from Cochin. The High School and College cost the Cochin Government Rs. 17,696 of which Rs. 1,872 were realised by fees: the actual cost of the school to the State was Rs. 15,823: the cost of the establishment for District Schools amounted to Rs. 24,025, the receipts from fines and fees being Rs. 2,975.

Examiners' Reports on the F.A. Examination.

(From the Syndicate's Report for 1879-80.)

Mr. A. Monro in his report says, "With regard to the F.A. candidates, all but one succeeded in obtaining the requisite number of marks to qualify, but few rose much above mediocrity. The Latin Prose was attempted by two or three candidates, but successfully by none. The translations were as a rule accurate and very fair in style, but the grammar with a few exceptions poor. The pieces set for

parsing and explanation were fairly done, but many of the candidates seem to have forgotten the elementary parts of Latin Grammar."

Mr. J. Marsh remarks about the papers examined by him as follows:—"I must call the attention of the Syndicate to the very loose style which characterizes the majority of answers to the questions on book work, and more especially those on Euclid's Elements. In question IX, I asked for three of Euclid's definitions, and it might be amusing, though profitless, to cull from the papers the definitions, that have been given of every one, *viz.*, a cone, a cylinder, and an icosahedron. What however I would point out is that many candidates have failed to see that not only is "the revolution of right angled triangle" necessary for the generation of the solid figure, the cone, but that the other parts of the definition, "about one of the sides containing the right angle," and "which side remains fixed," are equally essential. The same remarks, *mutatis mutandis*, are applicable to the definition of the cylinder. With reference to the icosahedron, it is almost incredible how many candidates have failed to see that there is a wide difference between "contained by" and "containing" and again between "twenty equal and equilateral triangles" and "twenty equilateral triangles." In writing out proposition 11 of the XIth book, many candidates, who, judging from the general character of their papers, may be regarded as having made honest preparation for the ordeal, have yet regarded as altogether superfluous such essential statements as (I use the notation in the usual text book) "draw any straight line BC *in the plane* BH." "if not, from the point D draw, *in the plane* BH, &c." and therefore AF is at right angles to each of the straight lines GH and DE *at the point of their intersection*." Proposition 18 of the same book meets with the same fate, and such a statement as "draw FQ at right angles to CE" is by far of too frequent occurrence, the important fact of "*in the plane* DE" being entirely ignored. Further, the text is careful to affirm that "In the same manner, &c." before the final conclusion that "every plane passes, &c" is asserted, but this, by the majority of the candidates who have attempted the proposition, has been deemed altogether non-essential to the establishment of the universality of the proposition. The number of candidates who have attempted to solve question XII is not very great, but of these, it is astonishing to find, how few have grasped completely the definition of similar rectilineal figures. Some have been satisfied with showing the equality of the angles in the figures, and others with showing that the sides about the equal angles are proportional, while few, indeed, have thought it necessary to establish both, before asserting the figures to be similar. A proposition of Euclid is a perfect chain of reasoning, and when statements like those I have mentioned are omitted the chain is broken, and only the unconnected parts, perfect so far they go, remain. The inference from the character of the papers would seem to me to be that, in the Colleges from which the candidates come, not sufficient exercise is given in class in writing out the book work on paper. Oral examinations, in which the promptings and connections of the teacher are ever present, would seem to prevail too exclusively, and with the result when the teachers' aid is withdrawn that I have above pointed out.

The book work in Trigonometry is also, in many instances, given very loosely."

The B. A. Examination.

Mr. A. Monro in his report says "The B. A. papers are on the whole good. The translations were generally very fair, though several of the candidates were inclined to loose paraphrase rather than to accurate rendering of the passage set.

The grammar-paper was done well by three candidates but indifferently by the rest. All candidates attempted the piece set for Latin Prose, but only three with any success. Two of these sent up fairly readable specimens of Latin. Their pieces were free from grammatical mistakes and showed some acquaintance with the idioms and construction of the language.

These candidates Nos. 9 and 33 in the list of passed B.A. candidates were *facile principes* in every respect and have, I think the making of good scholars in them. It is to be hoped that they will prosecute their studies further and proceed to the M.A. Degree."

The Medical Department.—Another young Madrassee, Mr. Charles Burton, junior, son of Mr. C. Burton, Bookseller, Black Town, who received his preliminary professional instruction in the Medical College at Madras, has passed an examination in Edinburgh, qualifying him to compete for admission into the commissioned ranks of the medical service. There are now more than twenty East Indians in the commissioned ranks of the medical service, all of whom won high places in the final examinations held in the leading medical institutions of Great Britain. This is a very gratifying fact, and we have no doubt that the ten young men from Madras, late students of the Madras Medical College, who are now prosecuting their professional studies in Europe, will be added to the list.

The Danger of Skipping.—It has been argued lately that girls are overburdened with book work, and a cry has been made for more physical exercise. It seems that there is danger in the playgrounds as well as in the school, and that the skipping-rope is a source of much physical suffering. The *Globe*, in discussing the statement of some medical men on the subject, observes that the skipping-rope has commonly been reckoned among the healthiest and best exercises and amusements for girls. It will be with some little surprise and incredulity that many persons will learn that it has been seriously impeached by an eminent surgeon connected with one of the surgical institutes of America as the occasion of a great deal of mischief. It is declared, indeed, to be a prime cause of cripples among girls. The surgeon in question has recently had occasion to perform an operation involving the removal of the bones of both legs of a child, necrosis having been caused by rope-skipping. He affirms that such mischief is of frequent occurrence, though usually it shows itself as necrosis of the spine. Not a month passes without patients presenting themselves at the institute with which he is connected to be treated for injuries resulting from the continuous jarring and concussion of the bones in this "pernicious pastime." This, as apart from the consequences resulting from mere over-exertion to

which girls are often stimulated by ambition to keep up longer than another, or to skip a thousand times without stopping. Scarcely a season passes, we are told, without several cases being reported of girls dropping dead after such feats. The danger involved in such straining of young powers is, of course, obvious enough, and emulation of this sort should generally be discouraged, not only in skipping, but in all other forms of muscular exercise. There may be danger, too, in a too constant and frequent use of the skipping-rope, apart from such feats. Still, for healthy children, a moderate amount of the exercise may be wholesome enough, only girls should be taught how to reduce the jolting to a minimum by making proper use of the toes instead of coming heavily down on the heels, as they may be often seen to do. At the best, however, skipping is not the unexceptionable pastime it is usually supposed to be, and should be only sparingly indulged in.

Apparatus and Chemicals

For the teaching of Roscoe's Chemistry Primer pp. 1-67.

The following priced list of apparatus and chemicals necessary for the practical teaching of the Chemistry Primer prescribed for the Matriculation Examination of 1881, may be of value to teachers. At the end of the Primer itself a list will be found, but though suitable for England it is, in many respects unsuited for India. The subjoined list is made to coincide with it as far as possible, but the quantities of chemicals and of breakable apparatus will be found as a rule to be doubled. This should provide sufficient material for the teaching of the subject, to the extent at present prescribed, for at least 5 or 6 years to come, if ordinary care and economy be exercised in the use of the materials. In the next number of the Journal we propose giving some practical hints on the experimental teaching of the Chemistry and Physics Primers, which may not be unacceptable to such teachers as have had no practical training in the handling of apparatus. The total cost of apparatus and chemicals quoted below amounts to £7-13-0 in England, without cost of packing, freight, insurance, &c.; or if the better class of balance, electrolytic apparatus, &c., be ordered £10-4-6 will cover the whole, less freight, &c.

Several of the pieces of apparatus might perhaps be made in the bazaar, such as the tin-tray, test-tube rack, water-bottle (from an old kerosene tin) &c., &c.; and a few of the chemicals might also be had in the bazaar at two or three times the English price, and as a rule very far from reliable in point of purity. We would therefore strongly advise teachers to order their chemicals direct from England: and it will give least trouble to order all the apparatus together.

The apparatus is obtainable from any of the following science depôts:—

(1) Messrs. J. J. Griffin and Sons, 22, Garrick Street, Covent Garden, London, W. C.
(2) Messrs. J. Woolley Sons and Co., Manchester.
(3) Messrs. Mottershead and Co., 7, Exchange Street, Manchester.
(4) Mr. W. Statham, 111½ Strand, London, W. C.
(5) Mr. Edward Paterson, Scientific Apparatus manufacturer, 76, Little Britain, London, E. C.
(6) Messrs. Aug. Bel and Co., 34, Maiden Lane, Southampton Street, Strand, London, W. C.

(7) Messrs. Mawson and Swan, Scientific Apparatus Importers, Newcastle-on-Tyne, England.

N.B.—It should be mentioned that Indian orders, to insure attention being paid to them, ought to be accompanied with remittance in full or part payment of the amount of the order: and the Instrument maker should be requested to pay particular attention to packing, especially of the chemicals, and to see that the outside case containing the whole is sufficiently strong.

No. of Expt.	Apparatus required.	Price in England. £	s.	d.
1	(*a.*) 1 gas collecting bottle (quart size, with wide mouth)	0	0	6
	(*b.*) 3 small wax tapers with wire taper-holder.	0	0	4
3	(*c.*) glass tube containing a taper with U tube for caustic soda, and caoutchouc tubing to connect to aspirator ...	0	1	6
	(*b.*) 1 two-gallon porcelain water bottle or aspirator fitted with brass tap ...	0	5	6
	(*c.*) 1 pair of hand scales, with glass pans and weights, from 2 oz. downward, in oak-box	0	4	6
	(*N.B.*—When the expense can be afforded, we should recommend a better balance, say with a 9 or 10 inch beam, 3 inch scale pans, and turning with $\frac{1}{10}$ grain when the pans are loaded with 1000 grains; price about £2.)			
4	A tin-tray 6 inches by 10 inches with 1 inch rim all round (may get made in bazaar) ...	0	0	3
5	(*a.*) Iron tripod stand	0	0	10
	(*b.*) A spirit lamp, with burner to screw in ...	0	2	0
	(*c.*) 4 two-oz. German hardened-glass flasks @ 3*d.*	0	1	0
	(*d.*) 6 Florence-flasks @ 1*d.*...	0	0	6
6	(*a.*) A wide glass globe 8 to 9 inches diameter for burning phosphorus in	0	3	0
	(*b.*) 1 metal cup on iron foot to hold the phosphorus		1	3
7	Glass-tubing 2lbs. *assorted soft glass tubing* from capillary size to $\frac{1}{2}$ inch diameter @ 1*s.* 2*d.* per lb.	0	2	4
12	(*a.*) Apparatus for decomposing water by electricity with 2 collecting tubes and wires to suspend them	0	2	0
	(This is not a very satisfactory piece of apparatus. It is such an important experiment that we would recommend *Hoffmann's* apparatus for the electrolysis of water price about 12)			
	(*b.*) "A"-cell Grove's battery in wood tray with wires (insseparato porcelain, glass, *or* vulcanite cells)	1	16	0
14	(*a.*) 1 glass-mortar and pestle	0	0	10
	(*b.*) 1 gas eprouvette or large test-tube ...	0	0	6

15	(*a.*) glass flask with acid-funnel and bent glass delivery tube fitted to flask by good cork or bung	0	1	6
	(*b.*) Stoneware pneumatic trough with beehive shelf and 3 stoneware gas trays ...	0	3	6
	(*c.*) 6 wide mouthed gas-collecting bottles (pint size)	0	2	0
20	A pint-flask, wash-bottle, 2U. shaped calcium chloride tubes, and hard glass tube to contain copper oxide (2 sets @ 4*s.*) ...	0	8	0
21	(*a.*) 4 eight-oz. stoppered glass Retorts ...	0	3	0
	(*b.*) 1 Retort stand with 3 rings and clamp for test tube	0	5	6
25	(*a.*) 2 three-inch glass funnels	0	0	6
	(*b.*) 2 four-inch glass funnels	0	0	9
	(*c.*) 200 filter papers	0	1	6
26	1 three-and-a-half-inch porcelain evaporating basin	0	0	5
29	4 spare acid funnels @ 6*d.*	0	2	0
30	4 test-tubes, or small flasks, of hard glass.	0	0	8
31	1 small horse-shoe magnet	0	0	6
	1lb. iron filings in bottle	0	0	4
32	A palette knife	0	0	6
34	2lbs. coal and 1lb. charcoal	0	0	6
	4 long tobacco pipes (clay) @ $\frac{1}{2}$*d.* each ...	0	0	2
	(Much better to have a small iron or brass bowl into which the delivery tube might screw price say 1*s.* 6*d.*)			
35	1 Bunsen burner, may be omitted when a supply of gas is not available.			
37	1 piece iron-wire gauze 6 inches square ...	0	0	3
	(1 Davy-lamp may be ordered price 5/-).			
	Miscellaneous adjuncts which it is advisable to provide.			
	1½ dozen 5 inch test-tubes	0	1	6
	1 test-tube holder	0	0	6
	1 blow-pipe for use in bending glass tubes, &c.	0	2	0
	3 steel files (1 round and 2 triangular) ...	0	2	0
	6 dozen best corks assorted (say 1 dozen bungs 2 dozen large corks; 3 dozen assorted phial corks)	0	3	0
	1 set of cork borers (6 brass tubes, sharpened at one end)	0	2	6
	3 test-tube cleaning brushes	0	0	9
	1 test-tube rack for holding 12 test-tubes ...	0	2	0
	2 pipettes with bulbs or cylindrical dilatations.	0	1	0
	Total cost of apparatus £...	5	9	8
	(If a good balance, Hoffmann's apparatus, iron-coal-gas apparatus, and Davy lamp be ordered £2-12 extra.)			

No. of Expt.	Chemicals required.	Price in England. £	s.	d.
3	½lb. caustic soda (solid) in stoppered bottle.	0	0	9
4	1lb. quicklime in do. do. ...	0	0	6
5 (a.)	1 quart methylated spirit of wine ...	0	2	0
(b.)	4 oz. copper turnings in bottle	0	1	4
(c.)	2 oz. sulphur (flour) do.	0	0	3
6	1 oz. yellow phosphorus in stoppered bottle	0	0	6
13 (a.)	50 grains Potassium in do. ...	0	2	0
(b.)	½ oz. dry Litmus in do. ...	0	0	2
(c.)	250 grains Sodium in do. ...	0	1	0
14	2lbs. mercury (pure) say @ 5s. 6d. per lb...	0	7	0
15	1lb. zinc (in clippings or granulated) ...	0	0	9
20 (a.)	1lb. calcium chloride in stoppered bottle...	0	1	6
(b.)	4 oz. cupric oxide in stoppered bottle ...	0	2	0
22	¼ oz. pure silver nitrate (in sticks) ...	0	1	2
23 (a.)	1lb. soda crystals in bottle	0	0	3
(b.)	8 oz. alum do. do.	0	0	2
24	1lb. sulphate of copper in bottle ...	0	0	3
25	¼ oz. indigo (to make sulph. indigo solution)	0	0	5
28	1lb. powdered gypsum in stoppered bottle.	0	0	4
29	1lb. marble in chips	0	0	4
30	2 oz. red-oxide of mercury in bottle ...	0	1	8
	6 oz. acetate of lead in bottle	0	1	0
30	Repeated (a.) 1lb. chlorate of potassium at bo.	0	2	0
	(b.) 1lb. binox. of manganese in bo.	0	0	3
38 (a.)	7lbs. nitric acid (2 quart bottles stoppered.)	0	6	0
(b.)	10lbs. sulphuric acid (strong) (2 quart bo.)	0	3	0
(c.)	1lb. nitre or Potassium nitrate in bottle ...	0	1	4
39	A piece of "blacklead" or graphite ...	0	0	3
	½lb. lamp black	0	0	3
	Total £...	1	18	9
Additional.				
	8½lbs. (1 quart bo.) Hydrochloric acid in stoppered bottle	0	1	3
	10 stoppered bottles to hold above chemicals @ 3d	0	2	6
	10 common bottles unstoppered for do. @ 1d	0	0	10
	Total for Chemicals £...	2	3	4

J. COOK, M.A.

[To save Head Masters, and School Managers the trouble of copying out this list, we have printed a few extra copies on thin paper for Overland postage, and the Manager of the Madras Journal of Education will be happy to send any of the Subscribers to the Journal, a copy of this list, on receipt of half an anna stamp and a directed envelope.—ED. M. J. of E.]

THE MATRICULATION PHYSICS PAPER (1879).

(Questions and Answers).

PART I.

Q. I. *Is the centre of gravity of a body necessarily in the body? Describe any experiment you might show to illustrate your answer.*

Ans. No. The C. of G. of a body need not necessarily be *in* the body: for example in the balance, the centre of gravity is *below* the axis of suspension, and usually outside of the *substance* of the beam and scales entirely.

Illustrative experiment.

If I take a ring, or a triangle, or a parallelogram made of wire, and *try* to find a point about which it can be supported *in any position*, I fail to find such a point anywhere *within the material* of the ring; but if I tie two fine threads tightly across the ring, say so as to cross at the centre, I find the centre is the point about which the ring will remain balanced in any position. This point is in each of these three instances, inside the *figure*, but *without* the *material* or body.

Q. II. *Correct the following statement so as to make it physically accurate:—"The surface of a liquid is horizontal." Give briefly, reasons for your correction.*

Ans. The surface of a liquid is horizontal if (i) the liquid be *at rest*, if (ii) it be not *too small* in quantity, if (iii) it be not *too large* in quantity, and if (iv) its surface be *not interfered* with as by capillarity.

For (i.) If the *liquid* be in *motion* its surface is not level or horizontal as we see in the case of a stormy sea, or of a bowl of mercury disturbed. The latter shows perfect horizontality by correct reflection, and if we look on a bowl of mercury standing on the table, the slightest touch of the table destroys the perfect horizontality.

(ii.) If the liquid be in very small quantity, as a *drop*, its surface is more or less globular, being shaped by the force of cohesion.

(iii.) If the liquid be in *large* quantity, as the *ocean*, its surface is curved and not horizontal, being shaped by the force of gravity.

(iv.) If the surface of a liquid be interfered with by the force of adhesion, or of capillarity, as is seen at the side of a tumbler of water, or by dipping a narrow tube in the liquid, the surface rises up from the horizontal and clings in a curve to the tumbler or to the sides of the glass tube. In the latter the level inside the tube may be very much above the level *outside*.

Q. III. *If I varnish a lump of gold whose specific gravity is 19, and weight 1lb., and weigh it (i) in water and (ii) in mercury, what will be its apparent weight in each case? Explain fully the reasons for your answer.*

Ans. A body immersed in any liquid loses weight apparently by an amount equal to the weight of its bulk of the liquid. Now as gold has a sp. gr. of 19, this is but another way of saying, its weight is 19 times the weight of the same bulk of water. Thus $\frac{1}{19}$lb. =

weight of its bulk of water = amount by which it loses weight. Therefore apparent weight in water = 1lb. − $\frac{1}{13\frac{1}{2}}$lb. = $\frac{12\frac{1}{2}}{13\frac{1}{2}}$lb.

Again if immersed in mercury (*N.B.* it is varnished simply to protect it from amalgamation with the mercury which would disturb the result,) it will be buoyed up by $13\frac{1}{2}$ times as much as when it was immersed in water *i. e.* by $13\frac{1}{2} \times \frac{1}{13\frac{1}{2}}$lb. = $\frac{13\frac{1}{2}}{13\frac{1}{2}}$lb. Hence apparent weight in mercury = 1lb. − $\frac{13\frac{1}{2}}{13\frac{1}{2}}$ lb. = $\frac{0}{13\frac{1}{2}}$ lb.

Q. IV. (*a.*) *Define energy and work: and state how they are measured mechanically.*

Ans. (*a.*) *Energy* is the capacity of doing *work*; and *work* is the overcoming resistance of any kind; *e.g.* the *energy* of a cannon ball in motion is the amount of work it is capable of performing: and the *work* is the amount of resistance it can overcome, such as the thickness of wall or iron-plate it could penetrate. The mechanical measure of energy is of course the mechanical measure of the work it can accomplish *when all spent*; and the mechanical measure of work done is expressed by the weight it would raise through a space of 1 foot if the energy be applied so as to bear upon such a weight. *E.g.* the cannon ball might be made to hit upon a thick plate which by its motion under the stroke would raise a weight a certain height. This would give us a measure of the striking energy of the ball.

Q. IV. (*b.*) *Give four examples not in the Physics primer of* (i) *energy in action and* (ii) *energy in repose. How is the latter to be measured.*

Ans. (i.) *Energy in action.* (1.) The *motion of the tides* is a kind of energy in action that might easily be utilized oftener than it is. (2.) A *glacier moving down a mountain side* has an energy that has frequently manifested itself in fearful results. (3.) A piece of candle shot from a gun has an energy sufficient to penetrate the door of a room. (4.) A meteoric stone falling has an energy which makes it sink in the earth to a considerable depth.

(ii.) *Energy in repose.* (1.) A clock weight when wound up has an energy of repose, which is translated into active energy only when we start the pendulum. (2.) A catapult when stretched has an energy of repose which comes into actual energy only when we let go. (3.) A trigger of a gun is an example of energy in repose. (4.) The gunpowder possesses another kind of energy (chemical) in repose. Energy in repose is to be measured by the amount of actual work it performs when allowed to appear as actual energy.

Q. V. *Describe two simple methods by which you might estimate the velocity of sound in air.*

Ans. (i.) If we see a gun fired at a known distance, say at a distance of 1 mile, we have only to note the interval of time that elapses between our seeing the flash of the gun and our hearing the report.

We should find this to be about 5 seconds if the gun were fired 1 mile off.

(ii.) By means of an *echo* we may easily find the velocity of sound and in this way. If I stand $\frac{1}{4}$ mile from a high rock, and shout I hear my shout returned to me, the interval of time elapsing between my shouting and my hearing the echo of the same, is the time that the sound has taken to travel to the rock and back: *i. e.*, in this particular case half a mile, and the time required we should find to be about $2\frac{1}{2}$ seconds. We might by a few trials find the spot at which we should have to stand, so that the echo would return to us in say exactly 2 seconds; then the distance of the rock measured would give us the velocity of sound per second.

PART II.

Q. VI. *State as clearly and as fully as you can the various reasons for the selection of mercury in the construction of* (i) *the barometer and* (ii) *the thermometer.*

Ans. (i.) Mercury is selected for the *barometer* chiefly on account of its weight, this being $13\frac{1}{2}$ times as much as water bulk for bulk, we require only $\frac{1}{13\frac{1}{2}}$th of the length of tube we should require for a water barometer. The height of the latter would be over 33 feet, and this alone would prevent its common use. The fact that mercury does not so readily pass off into *vapour* as water or other lighter liquids do, also requires to be mentioned. For though we had a water barometer constructed, it would be impossible to have anything like so good a vacuum at the top of the column; the vapour of water would fill the upper part of the tube, depress the liquid column and so mislead us as to the real pressure of the air: moreover this contained vapour would be very sensitive to changes of temperature, which again would complicate its use as a measure of the atmospheric pressure.

(ii.) Mercury is used in the *thermometer* chiefly on account of its small specific heat, its moderate expansibility and contractibility under changes of heat, and the extensive range of temperature to which it may be subjected without passing into the solid (or frozen) condition on the one hand, or the gaseous (or vapour) condition on the other.

Its small specific heat which is $\frac{1}{30}$th that of water renders it much more sensitive and convenient in the estimation of temperature, for its own heat will not materially change that of the body to which it is applied.

Its moderate expansibility and contractibility with changes of temperature render the instru-

ment less bulky than it would otherwise require to be.

Its endurance of considerable changes of temperature extends its usefulness from cold latitudes to the warmest on the globe. It remains liquid long after water would be frozen in a cold climate, and long after water would have passed into vapour or steam.

Q. VII. (a.) *If each of the following—copper, mercury, water, air, were raised in temperature by 100° C. from an original temperature of 1° C. what would be the approximate amount of expansion resulting in each case?*

Ans. (1) If a *copper* rod 100,000 inches long be heated from 1°C. to 101° it will expand by 571 inches.

(2) If 100,000 pints of *mercury* be heated in like manner, it will swell up by 1,815 pints.

(3) If 100,000 pints of *water* be heated from 0° to 100° it will swell up by 4,315 pints: but if it be heated from 1° by 100° it will be all converted into steam at 101°; and each pint of water will have become about 2,700 pints of steam. (We may neglect the expansion of steam under a rise of temperative from 100 to 101°.)

(4) If 1,000 cubic inches of air (or *any gas*) be heated in the same way from 1°C. to 101°C. it will have become 1,367 cubic inches.

The *general principle* underlying all these facts is that solids expand much less than liquids, and liquids far less than gases, and that the nearer the body is to the gaseous condition the greater is its expansibility; for the more fluid or liquid water expands more than the less liquid mercury.

Q. VII. (b) *Give a general explanation of the physical principle underlying the facts brought out in your answer.*

Ans. (b) The general explanation of the underlying principle is that the expansive force of heat has to contend with the opposing force of cohesion: in solids this force is strongest and progress or expansion against it is consequently small and slow: in liquids the force of cohesion is to a great extent overcome, the particles being separated from each other to such an extent that they lie without the circle of mutual embrace, hence the resistance to expansion is lessened; and more so in some liquids than in others: lastly in gases the force of cohesion is altogether overcome, and the resistance to expansion is merely that of the external pressure on the gas. The same heat expanding power will thus have very different effects in these different cases.

Q. VIII. (a) *Describe experiments by which you might compare in a simple way, so as to illustrate the subject,* (i) *the specific heat of water with that of mercury;* (ii) *the latent heat of water with that of steam.*

Q. VIII. (b) *Give approximately a numerical estimate of these.*

Ans. (i) *To compare the specific heat of water and of mercury.*

If I take 1lb. of *m.* at 0°C. and heat it till my thermometer shows it to be at 100°C., and if I now pour this 1lb. at 100°C. into another 1lb. of *m.* at 0°C., I shall find the resulting temperature of the mixture to be 50°C., or the *mean* between the two.

If I take 1lb. of *m.* again, and heat it up to 100°C., and now pour it into 1lb. of *w.* at 0°C., I shall find that the temperature of the *w.* is very little raised compared with what the 1lb. of *m.* at 0° was by the mixture: in fact I shall find that the temperature of the mixture is only $3\frac{1}{2}$°C. so that the 1 lb. of *w.* has 'swallowed up' a great many times as much heat as 1 lb. of *m.* would have done to raise it from 0°C. to $3\frac{1}{2}$°C. for it has swallowed up the heat that would be required to raise 1 lb. of *m.* from $3\frac{1}{2}$°C. to 100°C., i.e., through $96\frac{1}{2}$°C. of temperature; that is to say it has taken 30 times as much heat to raise 1 lb. of *w.* by a certain temperature as it would have taken to raise 1 lb. of *m.* by that same temperature.

We might show the same thing in another simpler, though more rough and ready way, thus: If I heat 1 lb. of *m.* in a glass vessel over a spirit lamp, which may be supposed to burn uniformly and thus give off its heat at a uniform rate per minutes, I shall find that its temperature will rise, say by 10° in 1 minute; if now I take 1lb. of *w.* in an exactly similar glass dish and heat it over the same spirit lamp I should find it would take nearly half an hour to raise the temperature of the 1lb. of water by 10°.

Or again if I take 1lb. of *w.* and 1lb. of *m.* in similar glass vessels and heat both for the same length of time, say 5 minutes, I should find that the *m.* was very much hotter than the *w.* both tested by a thermometer; now the amount of heat, however we may estimate it, required to raise 1lb. of water by 1°C. being taken as the unit of heat quantity, the specific heat of any other substance is the relative amount of heat (estimated of course in the same way) required to raise 1lb. of the other substance by 1°C.

(ii.) *To compare the latent heat of water with that of steam in an easy way.*

I shall take 1lb. of ice at 0°C, and heat it in a glass dish over a spirit lamp till it has just all melted into water at 0°C. This heat, which has had to be expended in simply breaking down the solid water into the liquid shape, I should find to be the same as that required to raise 79lbs. of water by 1°C., and this I might find by noting the *time* required to effect each change by the same spirit lamps.

If, next, I take 1lb. of water, raise it to the boiling temperature 100°, and note the *time* it takes to pass all off in steam when kept heated by the same spirit lamp; I should find it was exactly the same as the time taken to raise 537lbs. of water by 1°C. by the same spirit lamp.

Ans. (*b*) The specific heat of water : specific heat of mercury :: 30 : 1; and latent heat of water : latent heat of steam :: 79 : 537.

Q. IX. *If I fan myself I feel cooled in consequence; if I take a thermometer and fan it, I find there is no fall of its temperature. Explain clearly the physical reasons of the apparent contradiction.*

Ans. The thermometer and my skin are in very different conditions: the thermometer is *dry* and my skin is *moist* with perspiration. Hence as I fan myself, I bring new air near my skin to get charged with moisture from my body and so promote evaporation. But we know that evaporation is accompanied with abstraction of latent heat from the body containing the evaporating liquid, just as a porous goblet of water set in the wind is rapidly cooled by increased evaporation of the water exuded on its surface. Were our thermometer bulb moist and kept moist while we fanned we should find that its temperature would fall rapidly. Again my body is usually warmer than the air around it; but the thermometer is necessarily of the same temperature as the surrounding air: hence bringing new air in contact with my body robs it of heat by *convection*, whereas there can be no possible reduction of the temperature of the thermometer by the fresh contact with air of its own temperature.

F.A., Algebra and Geometry, 1879.

Solutions.

(For the Questions, see page 172 in the Journal for April.)

I. Proposition 11, Book II.

See Pott's Euclid, notes on Book II, Proposition 11.

Let a be the given line, and x the part required. Then,

$$a(a - x) = x^2$$

$$x^2 + ax - a^2 = 0$$

$$x = \frac{-a \pm \sqrt{a^2 + 4a^2}}{2}.$$

To interpret the negative value, take the figure of II, 11. Produce BA to K, so that AK = AH.

Then $BK \cdot AK = (BA + AH)\,AH$

$= BA \cdot AH + AB \cdot BH$

$= AB^2$

Hence, we *may* say that the negative value indicates that the problem must be changed thus. Produce a given line so that the rectangle contained by the whole and the part produced *may* be equal to the square on the given line.

II. Proposition 3, Book VI.

See Pott's Euclid, Notes on Book VI, Proposition 3.

Let AB, AC be the given lines. On BC as chord, describe a circle. Bisect the arc in K. On AK as diameter, describe a circle, cutting the former in P. Join BP, CP, KP, AP. The interior and exterior angles at P will be bisected by PMK, and PA. Hence

$$BM : CM = BA : AC$$

or $$BA - MA : MA - CA = BA : CA$$

Hence MA is an harmonic mean between BA and AC.

III. Proposition 4, Book IV.

Trigonometrically,

$$\frac{\gamma a}{\gamma} = \frac{S}{s-a} \times \frac{s}{S} = \frac{s}{s-a}.$$

Let O, P be the centres of the escribed and inscribed circles of the triangle ABC.

Draw OF, PK perpendiculars on AB.

Then AOF, and APK are similar triangles.

$$\frac{\text{Radius of the escribed circle}}{\text{Radius of the inscribed circle}} = \frac{AF}{AK}$$

$$= \frac{s}{s-a}$$

IV. Proposition D, Book VI.

Let AK be the sum of the sides, and KAO be the constant angle. Bisect the angle A by AO, and make AFO equal to KAO. Then A, O are the two fixed points. Take a triangle ABC, so that AC = BK.

Now because AO = OK (*con*);

$$BK = AC$$

$$\text{Angle } BKO = OAC$$

$$\text{Therefore } KBO = ACO$$

Hence a circle passes through A,B,O,C.

V. $$(x + yz)^2 = (1 - x^2)(1 - y^2)(1 - z^2)$$

$$(y + xz)^2 = (1 - b^2)(1 - z^2)(1 - x^2)$$

$$(z + xy)^2 = (1 - c^2)(1 - x^2)(1 - y^2)$$

Subtract II from I

$$(x^2 - y^2)(1 - z^2) = (1 - z^2)\{(1 - y^2)(1 - a^2) - (1 - x^2)(1 - b^2)\}$$

or $$a^2 - b^2 = a^2y^2 - b^2x^2.$$

Similarly $b^2 - x^2 = b^2z^2 - c^2y^2$

$$c^2 - a^2 = c^2x^2 - a^2z^2$$

adding up—

$$a^2y^2 - b^2x^2 + b^2z^2 - c^2y^2 + c^2x^2 - a^2z^2 = 0$$

$$\text{or } a^2y^2 - b^2y^2 + b^2z^2 - a^2z^2 = b^2z^2 - b^2y^2 + c^2y^2 - c^2x^2$$

$$\text{or } (x^2 - y^2)(z^2 - b^2) = (y^2 - z^2)(b^2 - c^2).$$

VI. See Chapter XXII, Todhunter's Algebra.

$$(a + bx + cx^2) + (2ax + bx^2)\gamma + ax^2\gamma^2$$

$$= a\left\{x^2\left(\gamma^2 + \frac{b}{a}x + \frac{c}{a}\right) + x\left(\frac{b}{a} + 2\gamma\right) + 1\right\}$$

$$= a\left\{x^2(\gamma - \alpha)(\gamma - \beta) + x(2\gamma - \alpha - \beta) + 1\right\}$$

$$= a\left\{x(\gamma - \alpha) + 1\right\}\left\{x(\gamma - \beta) + 1\right\}$$

$$= a(\gamma - \alpha)(\gamma - \beta)\left\{x - \frac{1}{\alpha - \gamma}\right\}\left\{x - \frac{1}{\beta - \gamma}\right\}$$

x should not lie between $\frac{1}{\alpha - \gamma}$ and $\frac{1}{\beta - \gamma}$, and γ, between α and β.

VII. See Chapter 30, Todhunter's Algebra.

See Exercise 10, Chapter 50, Summation of Series, Todhunter's Algebra.

Also the second article of that Chapter.

VIII. See Chapter 34, Todhunter's Algebra.

See Wood's Algebra. Companion p. 116.

$$(1 + x)^n = 1 + nc_1x + nc_2x^2 \ldots\ldots x^n$$

$$(1 + x)^m = 1 + mc_1x + mc_2x^2 \ldots\ldots x^m$$

Equate the coefficients of x^γ

$$(m + n)c\gamma = nc\gamma + mc\gamma - 1 + mc + \ldots\ldots mc\gamma$$

multiply by γ

$$(m + n)_\gamma = n_\gamma + \gamma m_{\gamma - 1}n_1 + \ldots\ldots m_\gamma$$

IX. See Chapter 36, Todhunter's Algebra.

$$\sqrt[3]{\frac{10}{7}} = \left(1 - \frac{3}{10}\right)^{-\frac{1}{3}} = 1 + \frac{1}{10} + \frac{1 \cdot 4}{10 \cdot 20} + \ldots\ldots$$

LA SHASTRA.

Mental Arithmetic.

(Set in London to Candidates for Schoolmistresses' Certificates).

Twenty minutes allowed for this paper.

You are to enter the answer in the space ( ) left for it after each question. Nothing is to be written on this paper, except the particulars required in the above table, and the answers (which must be written in ink) to the questions on the other side. No erasures or alterations are permitted. They will be marked as errors.

1. $(16 - 5) \times 11 \times 21 - 42 =$
2. In 8s. 5¼d. + 8s. 2¾d. + 5s. 2¼d., how many farthings?
3. 1,010 articles at 1s. 1½d. each =
4. Bought 30 eggs at 7½d. per doz., and sold at 1s. 7½d. per score; at what gain?
5. 2 cwt. 3 qrs. of tea at 4s. 2d. per lb. =
6. Amount of day's wages at the rate of £4 10s. 4½d. per month (30 days) =
7. $(\frac{1}{12}$ of $4\frac{1}{3} - \frac{1}{11}$ of $\frac{2}{13} + \frac{1}{711} =$
8. (1183 — 17[illegible]
9. [illegible]
10. Find the [illegible] following numbers, 80½, 19½, 1,600, 1[illegible], and 1.
11. Reduce $\frac{3}{5}\frac{4}{4}\frac{4}{4}$ to its lowest terms
12. Area of a plank 36 ft. long by 1 ft. 7 in. broad
13. Find the sum of the numbers, in order, from 1 to 700.
14. Simple interest on £193 6s. 8d. for 2 years at 3½ per cent =

Arithmetic Paper.

1. $(13 - 7) \times 20 \times 17 - 151 =$
2. 8s. 9½d., 17s. 9¾d., 11s. 1¼d., how many farthings?
3. 800 yards, at 1s. 3½c. per yard =
4. Bought 50 oranges at 9d. a doz., and sold them at 1s. 3½d. a score: at what profit?
5. 3 cwt. 1 qr. of [illegible] at 4s. 7d. per lb. =
6. Amount of day's wages, at £5 11s. 3d. per month (30 days) =
7. $\frac{13}{14} - \frac{5}{28} \times (\frac{7}{8}$ of $\frac{4}{7}) + 1\frac{13}{100} =$
8. (106·2 — 6·3) ÷ ·003 =
9. 3½ per cent. on £10,710 =
10. Find the *average* of the following numbers: 97, 1,003, 12, 50, and ½.
11. Reduce to their least common denominator $\frac{1}{3}$, $\frac{3}{10}$, $1\frac{1}{18}$.
12. The area of a pathway 93 feet long by 3 feet 4 inches wide =
13. Find the sum of the numbers, in order, from 1 to 500.
14. Simple interest on £556 18s. 4d. for 6 years at 5 per cent. per annum =

LONDON MISSION COMPARATIVE EXAMINATION.

March 1880.

VI. Class.

General English.

Time 3 hours.

Part I.

I. (a) Compose four sentences so as to use correctly the *pluperfect* tenses of the verbs :—*say, tell, write, lie down.*

(b) Compose four complex sentences so as to use correctly the *conditional future* tenses of the same verbs.

II. (a) Compose four complex sentences so as to use correctly the words :—*since, till, when, lest,* as conjunctions.

(b) Compose four simple sentences so as to use correctly the words :—*since, till, for, from,* as prepositions of *time.*

(c) Compose four simple sentences so as to use correctly the words : —*down, before, near, without,* as prepositions of *place.*

(d) Compose four sentences so as to use correctly the words : —*since, ago, down, after,* as adverbs.

III. (a) Compose four sentences so as to use correctly the expressions, —*rather than, no sooner than, however.*

(b) Compose four sentences so as to use correctly the words : —*never, other, rather, fuller,* without being followed by the conjunction *than.*

IV. What is the force of the terminations —*er* and —*or*, in the formation or the inflexion.

1st of Nouns,
2nd of Adjectives,
3rd of Verbs;

Give one good example of each, using it in a sentence.

Part II.

V. Explain and illustrate the terms : —

1. Cognate Accusative.
2. Factitive Accusative.
3. Adverbial Accusative.
4. Nominative Absolute.

VI. 1. What is a defective verb? How does it differ from an irregular verb?

2. Classify the auxiliary verbs under :—
(a.) Voice. (b.) Mood. (c.) Tense.

3. Form three sentences using the participle "*taking*" as :—
(a.) Present. (b.) Past. (c.) Future.

VII. 1. Explain the force of the words italicised : —
(a.) "Once a day. (b.) The matter is *under* discussion.
(c.) He sold it *by* the yard. (d.) It is *for* immediate action.

2. Distinguish between :—
(a.) Much and many. (b.) Farther and further.

VIII. 1. Give the :—
(a) Verb form of *smoke.*
(b) Noun form of *tell.*
(c) Adjective form of *shadow.*
(d) Two plural forms of *pea.*
(e) Diminutive of *lamb.*
(f) Common designation of *rat* or *ore.*

2. Form sentences illustrating the use of
(a) *Very* as an adjective.
(b) The indefinite article standing between the adjective and the noun.
(c) An adjective used as an abstract noun.

X. 1. Correct the errors in the following :—
(a) You have been too much kind upon me.
(b) I have known him before a long time.
(c) I expected to have received the parcel by the train last evening.
(d) A material for foundation equal as that cannot be found.
(e) This student has and will likely find success.

2. Write in the indirect narration.
"Is not your father in?" said he to Tonino.
"No, Sir. Do you want any thing? I will fetch him if you like."
"Oh no, it does not matter," answered the stranger, "I did want something, but I will go elsewhere."
"Is it anything that I can do?" asked Tonino.
"You!" cried the stranger with contempt. "You are too much of a boy. It is a great deal for you to know how to point those tacks as you are doing."

X. Write a short essay on the advantages or disadvantages of caste among the Hindus.

English Poetry.

Time 3 hours.

Part I.

I. Write out the story of Rosabelle in your own words, in a clear and connected narrative.

II. Give the derivations of the following words and point out any difference in their primary and conventional meanings :— minstrel, wealth, corpse, fate, dirge, rare, tempest, martyr, palfrey, rove, hero and chapel.

III. State what is the figure (or figures) used in each of the following expressions. Also paraphrase them.

1. "Gem! ne'er wrought on Highland mountain.
Did the fairy of the fountain
Or the mermaid of the wave,
Frame thee in some coral cave?"

2. "Fleet foot on the correi,
Sage counsel in cumber,
Red hand in the foray,
How sound is thy slumber!"

3. "Like the dew on the mountain,
Like the foam on the river,
Like the bubble on the fountain,
Thou art gone and for ever!"

4. "The autumn winds rushing
Waft the leaves that are soarest,
But our flower was in flushing
When blighting was nearest."

5. "Leave unfended the herd,
The flock without shelter;
Leave the corpse uninterr'd
Leave the bride at the altar."

IV. Parse the italicised words:

(*a*) *Then* stay *thee*.
(*b*) It *riddled* all the copsewoodfrigley.
(*c*) Seemed *all* on fire that chapel proud.
(*d*) Seemed all on fire, *within, around*,
Deep sacristy and altar's pale.
(*e*) So still they blaze, when fate is nigh
The lords of high St. Clair.
(*f*) Forward *each* man set.
(*g*) I'd rather rove with Edmund there
Than *reign* our English queen.
(*h*) I read you *for* a ranger sworn.
(*i*) *Yet* sang she "Brignall banks are fair."
(*j*) The bloodless claymore is *but* reddened with rust.
(*k*) From *wandering* on a foreign strand.
(*l*) And thus I love them better *still*.

V. Give the exact meaning of the following words and substitute English or more common forms for them:—inch, clan, plaid, correi, cumber, musketoon, sward, claymore, galley, pibroch, strand, targe.

VI. Write short historical introductions which will explain the Coronach and the Brooch of Lorn, and give Scott's estimate of the Unpatriotic Man.

Part II.

VII. Give the meaning of the words italicised:—

(*a*) Macbeth communicated the strange prediction and its *partial* accomplishment.
(*b*) The air is observed to be *delicate*.
(*c*) They *conjured* up infernal spirits.
(*d*) Antonio was the *best conditioned* man that lived.
(*e*) She had riches enough not to *regard wealth* in her husband.
(*f*) He took it *for a fit of* distraction.
(*g*) He invited all the chief thanes and among *the rest* Banquo and his son.
(*h*) Such as could fled and *the rest* secretly wished success to their arms.

VIII. Supply the appropriate prepositions in the following sentences:—

She returned to confer—her husband.
She found him inclining—the better part.
The king being tired—his journey went to rest.

He shut the door—his murderers.
She was not shaken—her evil purpose.
He amassed a fortune—lending money—great interest.

IX. Name the figures in the following sentences:—

1. From that time he bent all his thoughts how to compass the throne of Scotland.
2. With the *valour* of her tongue she so *chastised* his sluggish resolutions.
3. Macbeth doth murder sleep, the innocent sleep, that nourishes life!

X. Correct each of the following sentences:—

Bassanio said he should not sign to such a bond for him.
He tried to grasp at it, it was nothing but air.
She began to think he had failed of his purpose.
His regrets went on slowly.

XI. Give the opposites of the words italicised.

(*a*) A *partial* accomplishment. (*b*) A *contrived* murder. (*c*) With *distracted* words. (*d*) Her manners were *affable*.

XII. (1) The wicked suggestions of the witches had sunk too deep into the mind of Macbeth to allow him to attend to the warnings of good Banquo.
Write this sentence using (*a*) The comparative. (*b*) So.

(2) He sent a rich diamond to lady Macbeth, greeting her by the name of his *most kind* hostess.
Can the word *kindest* be used here for the words italicised? Give a reason for your opinion.

(3) The queen played the hostess with a gracefulness and attention which conciliated every one present.
Write the sentence substituting adverbs for the adjectives.

(4) Shylock was much disliked by all good men, and he as much hated Antonio because he lent money without interest.
Use the comparative.

(5) He began to envy the condition of Duncan, *who* slept soundly in his grave, against whom treason had done *its worst*.

(*a*) Substitute a conjunction and pronoun for *who*; and (*b*) The positive for the superlative.

XIII. (*a*) Write in the form of direct narration. "The first spirit called Macbeth by name *and bid him* beware of *the* thane of Fife. The second spirit called Macbeth by name and bid him have no fear but laugh to scorn the power of man, for none of woman born *should* have power to hurt him; and he advised him to be bloody, bold and resolute. The third spirit called *Macbeth* by name, and comforted him against conspiracies saying that he should never be vanquished until the wood of Birnam to Dunsinane hill should come against him."

(*b*) Indirect narration. "Has a dog money? is it possible a cur should lend three thousand ducats? Shall I bend low and say, Fair sir, you spit upon me on Wednesday last another time you called me dog,

and for these courtesies I am to lend you monies? Antonio replied: 'I am as like to call you so again, to spit on you again and spurn you too. If you will lend me this money, lend it not to me as to a friend but rather lend it to me as to an enemy, that, if I break, you may with better face exact the penalty.' 'Why, look you,' said Shylock, 'how you storm! I would be friends with you, and have your love. I will forget the shames you have put upon me. I will supply your wants, and take no interest for my money."

XIV. Analyse "Though placed so high, Macbeth and his queen could not forget the prophecy of the weird sisters, that though Macbeth should be king yet not his children, but the children of Banquo, should be kings after him."

UNIVERSITY OF MADRAS.

First Examination in Arts—1879.

ARITHMETIC.

Examiner.—P. Krishnaswami Chettiyar, M.A.

I. Reduce

$$\frac{\cdot25 + \dfrac{\cdot\dot{3}}{1 - (\frac{1}{3} \text{ of } \frac{3}{4} + \cdot05)} - \dfrac{\cdot\dot{2}\dot{6} + \cdot4 \text{ of } \cdot16}{1 + \cdot\dot{1}4285\dot{7} + \cdot5 \text{ of } \cdot\dot{3}8095\dot{2}}}{\cdot3 \text{ of } \cdot375 + \frac{1}{4} - \cdot125}$$

II. Find, by Practice, the value of 5 lbs. 10 oz. 6 dr. and 2 sc. of a medicine at 2 annas 10 pice per lb.

III. Of the Books of a Library, $\frac{1}{5}$ are Literature, $\frac{1}{4}$ Mathematics, $\frac{1}{6}$ History, $\frac{1}{8}$ Philosophy, and the rest Novels. What is the least number of Novels that the Library can have?

IV. A clock is too slow by 5 minutes at 20 minutes to 6 A.M. on a Sunday and is too fast by 8 minutes at 8 minutes to 5 P.M. on the following Wednesday. When does it show correct time during the interval?

V. A Society has two classes of subscribers. Each subscriber pays as many pice as there are subscribers in his own class. If the rates of subscription be as 3 : 1 and the total collections be Rupees 1,920, find the number of subscribers in each class.

VI. A uniform river channel 5 feet broad and 3 feet deep flows into a tank 220 yards long, 140 yards broad, and 20 yards deep, and fills it in 35 hours. At what rate does the channel flow per hour?

VII. A sovereign worth Rs. 11-2-8 consists of 2 parts of an alloy worth Rs. 2 per oz. and 20 parts of gold worth Rs. 40 per oz. What is the weight of the sovereign?

VIII. A bankrupt has assets double his liabilities. He realizes $\frac{1}{3}$rd of his assets in full, but is able to pay his creditors only 13 as. 4 p. in the Rupee. How much per Rupee does he realize of the remaining $\frac{2}{3}$ds of his assets?

IX. On a Railway Line, Telegraph posts are fixed at a distance of 80 yards from one another. A watchman at the 100th Telegraph post expecting a train observes it at the 122nd post, and at the same time sees a lamb at the next post to where he is, proceeding towards the Train at the rate of 3 miles an hour. He at once runs, and overtakes the lamb at the 102nd post and without loss of time driving the lamb off the line returns to his place walking at half his former speed. Just as he reaches his place the train comes up to the 102nd Telegraph Post. What is the speed of the Train?

X. A person has 10,000 Rs. stock in the 4 per cents. He sells $\frac{3}{4}$ths of it at a discount of 6 per cent. and invests the proceeds in Railway shares at 470 Rs. per share. He sells the remaining $\frac{1}{4}$th at 105 and invests the proceeds in the 5 per cents. at 84. The Railway shares pay 4 per cent. interest on 400 Rs. the amount paid on each share. What is the alteration in his income?

XI. A circular staircase going round a vertical cylindrical pole has to be carpeted. The number of steps is 100: the height of each step 1 foot: the width of the staircase 4 feet: the circular arc of each step $\frac{1}{11}$th the circumference of its circular section, the outer and inner arcs being arcs of concentric circles around the axis of the cylinder: and the diameter of the base of the cylinder 1 yard. Given that the area of a circle is $3\frac{1}{7}$ × square of the radius, and that the area of a section of a circle varies according to the arc on which it stands. Find the cost of carpeting the staircase with carpet $1\frac{1}{3}$ yards wide, at 1 Rupee per yard.

COLONEL MACDONALD'S INSPECTION OF SCHOOLS.

THE Director of Public Instruction having recently had an opportunity of visiting some of the schools at Salem, Palghat, Calicut and Tellicherry, had made the following remarks, on certain matters which attracted his attention, and published them in his Proceedings.

Salem College.—No copy of the general time-table had been sent to the Inspector of the division, nor was there any copy of any such table hung up in any part of the school. There were separate time-tables for the different classes. No provision was made in any of them for gymnastic exercises, but the Headmaster stated that this subject was taught between 4 and 5 P.M. As might be expected under such circumstances, there was no regular course of gymnastic instruction in any class. The time-table of the seventh class contained no provision for home exercises, nor had any been done during the year. The Register of admissions A. contained several incomplete entries for February. The explanation was that it had been handed over to one of the Assistant Masters, because the writing master and clerk was doing the work of a teacher. Five boys had been irregularly admitted as free scholars, four on the ground of poverty and one by order of the Inspector because he stood first in the lower school. The Headmaster stated that he had also admitted four or five other boys as free scholars in 1879 and 1880 without any authority. The orders about collecting school-fees had been irregularly carried out, boys who had paid no fees continuing to receive

instruction until the 7th or 8th and then being sent home. In some cases the fees had been collected after the 11th of the month. In the Matriculation class no fees whatever had been collected in December. Register F. for 1879 showed that not a single translation had been done in the Matriculation class, and that during several weeks there had been no examinations at all. On the 3rd March the paper set was on the English text-book. It is explained in the Standing Orders that there should be a difference in the character of the papers set before and after the midsummer vacation, and that papers on the text-books read during the year should be reserved mainly for the second half-year. In the lower fourth class this Register was blank, and the teacher stated that only one paper had been done during the year, and that was in Arithmetic. In the third class six examinations were entered without any date, but it turned out that these were oral examinations, and should not therefore have appeared in Register F. at all. In the second class there were only two examinations. From the statement of the Headmaster it appeared that no weight had been given to the marks in Register F. in awarding any of the prizes at the end of the year. Even such paper work as had been done had not received the attention which it should have done. Many exercises were very imperfectly corrected. In the fifth class the master had passed as correct the phrase "They graze when they are hunger." Mr. Yellatambi Pillay admitted that the boys never saw the papers after the corrections had been made. The papers were simply valued and set aside. The Headmaster did not know what holiday tasks had been set. The Library contained some entertaining books, but far too few and the last supply, notwithstanding the attention which has been drawn to this subject, was particularly deficient in this respect. Register G. (Corporal Punishment) was not kept at all. The necessity for such a register was shown by the fact that corporal punishment had been most improperly inflicted on a boy merely because he had written a letter to the Director, asking for a free scholarship. The reports to parents prescribed in paragraph 34 of the Standing Orders had never been sent. Several of the masters had not a proper supply of text-books and not one of them had been supplied with the Standing Orders. One master happened to have one as Municipal Inspecting Schoolmaster, and there were two copies in the school.

Town School Salem and Shivapet Town School.—The pupils in the second class had been examined for the lower Primary examination by the Inspecting Schoolmaster by order of the Inspector. The holding of this examination was irregular.

Government Girls' School, Salem.—The first class contained twelve girls, of whom six were in the class last year. These six girls had not even commenced compound addition. The other six had been promoted into the first class without going through the simple rules. Out of the twelve girls there were only two, who could take down 101,000. There was no writing except on slates, on the plea that there was no room for the desks, which were huddled away in a corner. It was certainly possible to make use of these desks, but even if the case had been otherwise, copy writing might have been taught without desks, as is done daily in the majority of the village schools.

Normal Class, Shivapet.—This school was under a single teacher, who was only a fourth grade man, trained in the Normal School of Vellore. This school was opened in May 1879. In December twenty students, none of whom had been more than six or seven months under instruction, appeared for the fifth grade and only six passed. All were, however, sent out, but not apparently to any definite work, as several were stated to be still unemployed. This batch was succeeded by twenty-two new men, two of whom left after a short time. There were 20 Normal students still on the rolls. Hygiene was not one of the subjects studied by the pupils, although it was one which they would probably have to teach. They were not taught, as at Palghat, to prepare a cheap globe to take with them to their schools. The specimens of maps shown were very poor. Although the class was held in the same buildings as the Shivapet Town School, no use was made of this school as a practising school nor was there any other practising school in the building. The Headmaster stated that last year each student was sent in turn to teach in the G. Division Combined School, and that he used to go himself to this school for about ten minutes to supervise the student thus sent. During his absence the other Normal students had nothing to do, as there was no one to attend to them. The Sawyerpuram Seminary was some time ago struck off the list of Normal schools, because Mr. Bickle reported that although the pupils were prepared to pass the certificate examinations no proper facilities were afforded them for learning to teach a class. It is obvious that the organization of the Normal class of Shivapet is radically defective in this respect. The Director trusts therefore that Dr. Bradshaw will, in communication with the Local Fund Board, endeavour to get this school placed on somewhat the same footing as the Normal school established by the Coimbatore Local Fund Board.

Palghat High School.—Here also there was no Register of corporal punishment, but it was a most satisfactory circumstance that the school had been carried on for six years without corporal punishment being resorted to. There was no monthly return B. return D. and the Contingent Register were not in the prescribed form. There was a copy of the Standing Orders in the school, but the teachers had no copies, and some of them were without text-books. Nine boys were irregularly holding free scholarships. Seven of these scholarships had been originally conferred when the school was under the Local Fund Board, but two had been given by the Headmaster. The air-pump, which was part of a set of apparatus presented by the Local Fund Board, was out of order. No reports had been sent to the parents or guardians of the pupils.

Calicut College.—The time-table hung up was the one in force last year. It did not show the home exercises of the College classes. No copy of the monthly progress report C. was being sent to the Inspector, nor had any such report been prepared at all for the 6th, 7th and 8th classes. It was prepared last year for the remaining classes, but not for the months of November and December. During the current year no progress report had been prepared for any class. Register F. was irregularly prepared. In some columns there were no dates, in some no subjects, in others home exercises were entered instead of weekly examinations. Out of five or six examinations which were said to have been held this year in the 8th class only one had been entered, owing to the clerk being engaged in teaching

a class. Register G. had not been prepared, but the Headmaster stated that corporal punishment was never inflicted. The monthly returns C and D were not in existence. Prizes had been given for the year 1878, but not for the year 1879. The prize and library books were apparently received very irregularly, and the Headmaster complained that he did not get the books which he wanted. The boys of the 4th and 5th classes, it was stated, never took out any books to read because there were no suitable books for them. No reports had been sent to the parents of the pupils. The system of teaching translation seemed to be very defective. The exercises in translation from the Vernacular into English even in so advanced a class as the eighth, were usually entrusted to the Malayalam Moonshee, who was only a Matriculate. Here, as elsewhere the recitation of poetry showed that elocution was not receiving the attention which this subject demands. In some cases holiday tasks had been given, but there was no record of them.

Normal Schools of Palghat, Calicut and Tellicherry.—The system pursued in these schools presented a marked and favourable contrast to that in force in the Normal class of Salem. At Calicut the prescribed returns were not properly kept, there being no progress report on the last four columns in Register A. being left blank. The object of these columns is to show the date on which every Normal student leaves, the grade and class of certificate obtained by him, the school to which he gets appointed, and his position and salary. It is very important that this information should be available for future reference when required.

High School, Tellicherry.—The time-table was a table showing the work of the masters rather than the work of the classes. No provision was made in it for weekly examinations. Some of the exercises had been imperfectly corrected. Thus Mr. Lemerle had passed in a fifth class paper the phrase. "It seems to use" for "us." The Headmaster's brother, who had failed in the Comparative examination at Chittoor had been admitted into the Matriculation class. The second master in giving a lesson which related to a sloop being captured by a privateer, failed to make the class understand what a privateer was. He simply translated it as Swanta Kuppul. As at Calicut no use was made of the Library by the boys of the Middle school, because there were no books in it suited for them. The Headmaster stated that suitable books had been asked for during the last two or three years, but that they had not been supplied, the Inspector having apparently struck them out of the list submitted by him. There was no English Bible. The masters had not been supplied with all the text-books required. Register A. contained no column showing the date of a pupil's leaving. Register C. was not kept at all. There were no copies of the monthly returns A.B. & D.

On the above proceedings *The Englishman* makes the following remarks:—

Colonel Macdonald, Director of Public Instruction, Madras, has recently visited certain of his schools in Salem, Tellicherry, Calicut, and other districts and has published a report thereon which is calculated to cause considerable flutter in those ill-fated establishments. His remarks would occupy about a column in small

print, and read like the charges of a Court-Martial. Salem College may perhaps be allowed the place of honour among the delinquents, having peculiarly distinguished itself by freedom from ordinary official restraint in the conduct of its routine work. Innumerable forms A. B. C., and registers and returns D. E. F., had been neglected with a happy facility. A good deal of haziness also seemed to prevail as to when one course of studies ended and another began; while in an exercise the original phrase, "they graze when they are hunger." indulged in by a student struggling with the intricacies of the English language, had been left uncorrected, but which Colonel Macdonald's extremely grammatical mind had at once detected. One poor lad had been caned, merely because, in the pure innocence of his heart, he had written to the Director asking that a free scholarship might be granted him. It will be seen to what educational depths the girls' schools also at Salem, had similarly sunk, when it is learnt that only two pupils could take down the figures 101,006, and not even these powerful minds had yet mastered the mysteries of compound addition. In the Palghat High School, signs of degeneracy and decay might be deduced from the lamentable condition of the air pump. Altogether this establishment seems to have impressed Colonel Macdonald, much as Europe impressed the American, with its general look of despair. Calicut College, apparently unconscious of the flight of time, had been working on the time-table of the past year, and various returns had been made up on very original principles. At the Tellicherry High School, among other misdemeanours, one of the masters, while "giving a lesson which related to a sloop being captured by a privateer" had failed to explain what a privateer was. His pupils, therefore, were left to guess whether it was animal, vegetable or mineral. Perhaps the sloop proved equally puzzling, though Colonel Macdonald, apparently, is of opinion that the Madrassi is equal to the conception of a sloop. Hence no explanation was looked for on this point. Numerous other failings were also observed by the energetic Director in this school, but these probably only the experienced could appreciate.

MISSION HIGH SCHOOLS.

The subject of the Higher Education in Mission Schools calls for some notice. In years gone by the old school of missionaries, who were wedded to their own systems of work, looked askance on this mode of conducting missionary operations. They had devoted themselves to vernacular preaching, and the idea of European missionaries giving their time and strength to Anglo-Vernacular schools, and taking a conspicuous part in the University training of young men, was altogether foreign to their ideas of what was right and proper. Missionaries as a rule, live isolated lives, and are, therefore, naturally conservative. The popular idea at home of a missionary's work is that, armed with an umbrella and a bundle of tracts, he should go forth, and, under the shady branches of some wide-spreading banyan tree, state what he has to say to a crowd supposed to be "hungering and thirsting after righteousness." Even the Committees of Missionary Societies have been slow to see that the condition of things in the large centres of Hindu life and thought is totally

different to that amongst African savages, or the rude tribes of North-West Africa. Here is a nation awakening to a new mode of intellectual life, drinking in with an avidity few can realize, the refreshing streams of Western thought and light. Is this to be guided, to be influenced at all by what the Christian Church believes to be the highest truth and the noblest moral scheme that the world has ever seen? Duff, and men like him, replied in the affirmative to this question, and through evil report and good report held on their way. We believe there are ecclesiastical circles still, if not in India at least at home, where the expenditure of time and strength on missionary schools and colleges is regarded with more suspicion than approval.

The missionaries of South India and Ceylon, that is, the men who have most to do with it in this part of India—men who are fully acquainted with all the ins and outs of this debated question,—have arrived—apparently without a dissentient voice—at a conclusion equally removed from the fanaticism that would turn all missionaries into schoolmasters, and from the narrow literalism that sees no good in anything but the incessant task which is sometimes regarded as the only "preaching of the Gospel." The resolution is too long to quote, but the substance of it is that the Conference expresses "its full appreciation of the value of high class Christian education as a missionary agency," and that the "missionaries who are engaged in *Vernacular work* desire especially to bear testimony to the powerful effect in favour of Christianity which these institutions are exercising throughout the country, and to record their high regard for the *educational work* as a necessary part of the work of the Christian Church in India." The Conference has thus arrived at the conclusion that the evangelistic and the educational work are not opposed to each other, but are mutually supplementary; that the results for which the supporters of missions are always and not unnaturally calling out must proceed from neither separately, but from both wisely co-ordinated and combined. It is not to be expected that the actual conversions made through the instrumentality of schools and colleges can equal in number those made by missionaries working amongst lower classes and in rural districts. Indeed, the most intelligent advocates of the system look rather to the moulding of the character, to the raising of the moral tone, and to the creating of the feeling of individuality—a feeling so wanting to Hindu Society—than to any large number of actual conversions for a long time to come. Still, as far as the higher castes and classes are concerned, it is to Educational Missions that any accessions to the Christian Church must be credited. No living authority on this point is greater than that of Bishop Caldwell. He says:—"I have had some experience in the work of conversion myself and have tried, in succession, every variety of method. Let me mention then the remarkable fact that the whole of this long period (forty-one years) not one educated high caste Hindu, so far as I am aware has been converted to Christianity, in connexion with any mission or Church, except through the Christian education received in mission Schools. Such converts may not be numerous, and I regret that they are not, but they are *all that are*." The ordinary course of affairs in India has opened a door for making Christian views of the world, and of human life and duty, part and parcel of the ordinary

thoughts of the educated native community. Institutions in which the Bible is daily read and taught, find no difficulty in filling their classes with diligent students. It would be worse than folly were Missionary Societies to loosen their hold upon this most important branch of their operations. The question is now decided, as far as the men at work in the field are concerned. The Home Committees, and all who apply arithmetical rules to methods and modes of work which cannot be so gauged, should now accept the resolution we have referred to as the basis of all future operations.—*Madras Mail.*

*MARY CARPENTER.**

The world has its great women as well as its great men, though their work is generally of the quieter kind; they make less show, but they often do more good: and it is not till they are dead and gone that their meritorious deeds are appraised at their true value. The subject of this memoir was one of those whose whole life was a prolonged course of public usefulness, yet so unobtrusively did she work that, though by no means unknown to her contemporary philanthropists, it was not till she had passed away that even her best friends became fully aware how much she had done, with what struggles, with what persistent self-mastery, and with what noble results. Practically she was the founderss of our Industrial and Reformatory School systems. Not that she first started the idea, for that had been floating about for some years before she took any active part in them; but it was her energy, her tact, her industry, and personal effort that brought more abstract theories into concrete shape, and set them practically and effectively to work. She lived to see the principles which she had laid down universally adopted, sanctioned by Parliament, put into practice by the Government, promoted by the leading philanthropists of the day, and productive of good beyond her most sanguine hopes. More than this, she was enabled to undertake other work in India and America, setting machinery in operation in both these places, and imparting to those who worked it, something of her own ardent benevolence, meek wisdom, and glowing zeal.

In his Preface to this interesting Biography, the author says that "the chief object of his book is to tell the story of a life of singular activity and far-reaching usefulness, in the hope that some who are engaged in the same or in like duties may be helped by beholding the persistence of a woman's devotion." A perusal of every page of the volume assures us that this laudable object is not likely to fail of its accomplishment. But we hasten to put the reader in possession of the salient portions of her life and work. She was born at Exeter, in the year 1807, the eldest of a family of six. Her father was Dr. Lant Carpenter, a well-known Unitarian Minister, who afterwards presided over the principal congregation of that communion at Bristol. He also took pupils, amongst whom Mary Carpenter appears to have received from her father careful education in higher subjects than were then usually taught to girls.

* *The Life and Work of Mary Carpenter.* By J. Estlin Carpenter, M.A. pp. 495. Macmillan & Co.

When about twenty-three, she and a sister opened a school for girls, under the superintendence of her mother. Three years later she became acquainted, at her father's house, with a remarkable man, now forgotten, but worthy of long remembrance as a pioneer in the conversion of India—the Rajah Rammohun Roy. His splendid attainments, his persevering inquiries until he had convinced himself of the truth of Christianity, and his ardent desire to do something on a great scale for the conversion of India, fired the quick spirit of this earnest worker, and made her look to India as a most glorious field of Christian enterprise. She had already made a sort of vow to dedicate her life to works of usefulness; and the example of this new friend gave an Eastward turn to her zeal. But thirty years were destined to intervene before that work could be even begun. More pressing calls employed her nearer home. Rammohun Roy died after a short illness, to the infinite grief of all who had formed high hopes of him, and to a large circle of English friends and admirers. Shortly after his death another friend of her father—from the Western world this time—Dr. Tuckerman, came on a visit. He had been remarkable in the United States for the zeal and tenderness with which he had taken up the cause of destitute children. This was the hobby of his life; and when traversing the worst streets of Bristol his heart was moved at the squalor and crime that abounded. The subject was much talked of in the family, and one result was a resolution on the part of Mary Carpenter to make the reclamation of lost children the work of her life. One day, walking along Lewin's Mead—a squalid Bristol street—

'A miserable, ragged boy darted out of a dark entry, and rushed wildly across their path. "That child," remarked Dr. Tuckerman, "should be followed to his home and seen after." Nothing further occurred, but the observation was not lost. Six-and-thirty years afterwards she still recalled the incident as one of the quickening moments of her life.' (p. 45.)

From that time she sought opportunity of carrying out her grand object. She began in a humble way. A society was formed for visiting and helping the poor; she was its secretary, and took the worst district, where she gained her first insight into what she called "the perishing and dangerous classes." This was a trying position for a young woman of twenty-seven.

'From the geological cabinet, the drawing board, the well-stocked library of history and poetry, and all the bright and cheerful associations of refined family life, she had to plunge into the midst of squalor and misery, such as few cities in the kingdom could have presented. The narrow courts reeking with filth, the dark alleys, the wretched tenements, where every room had its own degraded inmates, filled her at times with unutterable loathing and disgust. The scenes, which she witnessed, fastened on an imagination peculiarly sensitive, rose in her nightly visions, and at times caused her painful excitement, well nigh intolerable. But she would not forsake the cause she had espoused. Again and again she had to force herself into contact with the foul air and fouler life that lay so near the peace and sweetness of her home; but, once there, the springs of pity were immediately unloosed, and what was begun with stern and almost desperate resolve was continued with free and spontaneous love.' (p. 48.)

A few years later she took up Ragged Schools with much eagerness. They seemed to realise her aims, and to furnish the machinery of which she was in search. She established one in Bristol, and became its superintendent. It was the beginning of a wonderful career among poor children. At this she worked devotedly.

'Two nights every week were regularly given, at no matter what social sacrifice, to the evening school; and day after day found her in the same haunt, ready to take a class, to preside over the midday distribution of soup to the most needy, or even to bear the sole charge of management, if sickness kept the master away. By this constancy she soon acquired a complete familiarity with the ways of the scholars, and also with the habits of the neighbourhood. Strong in the power of a sacred purpose, she was perfectly devoid of fear, and would traverse, along and at night, courts into which policemen only went by twos. Even the direst quarrel was hushed at her reproof, as a guilty lad slunk away to avoid her look of sorrowful reproach; and her approving word, with the gift of a flower, a picture, or a Testament, often made sad homes cheerful, and renewed the courage of the wavering.' (p. 110.)

This led to yet wider views. She began to feel that prisons could do nothing to reform young criminals, and she set herself to think what substitute could be found. She made, at this time (1850), the acquaintance of Mr. M. D. Hill, who warmly entered into her views. Thus encouraged, she wrote her first book, entitled "Reformatory Schools for the Children of the Perishing and Dangerous Classes," in which she discussed what could be done. This work gave a great impetus to the movement; and Miss Carpenter found it necessary to seek volunteers to help her, first in London and then in the North. Already there was much interest and scattered opinion in favour of this work: but it needed to be organized into a working system, and to this Miss Carpenter devoted herself with much courage and industry. A meeting was held at Birmingham under the presidency of Lord Lyttelton, when it was resolved to found three classes of schools:—

'First, *Free Day Schools*, for children who had not yet made themselves amenable to the law, but who, by reason of the vice, neglect, or extreme poverty of their parents, were not admitted into the existing Day Schools; secondly *Industrial Feeding Schools*, for those who had subjected themselves to police interference by vagrancy, *mendicancy*, or petty infringements of the law, attendance being enforced by the magistrates, and the cost being in part recovered from the parents; thirdly, *Correctional and Reformatory Schools*, for those who had been convicted of felony, or such misdemeanours as involved dishonesty, the magistrates being empowered to commit juvenile offenders to such schools instead of to prison.' (p. 157.)

Thus began, in unpretending form, the great Reformatory and Industrial system now planted so usefully in many parts of England, and still extending. Shortly afterwards some property was acquired at Kingswood, near Bristol, consisting of a house and twelve acres of land. Further funds being subscribed, the place was furnished and opened, and a beneficent work begun, which is still going prosperously on. In 1853, Miss Carpenter published her second book "Juvenile Delinquents; their Condition and Treatment," in which she investigated the causes of crime, the condition to be dealt with

and the process of recovery. For this her experience at Kingswood gave her unique qualifications. Whole pages give us accounts of the depravity, ungovernableness, and desperation of some of these children. But their benefactress had the secret of powerful sway within her in the thorough gentleness and love that ever reigned there. Time showed her how to apply these without waste, and to combine the firm government of fixed rule with the tenderness that can allow for and make exceptions. She possessed a wonderful insight into child-nature, and the conditions of success in her work. We constantly come upon such wise sentences in this :—"The child must be placed where he will be gradually restored to the true position of childhood." It was the adoption of this principle that led her so far towards success as to enable her to say :—

'I will be pleased to hear that our Kingswood boys are improving delightfully; indeed, a greater change has come over them in the last two months than I should have thought possible. This I attribute chiefly to our gardener, who makes them take delight in their work; indeed, the effect of the agricultural training upon them even surpasses my expectations. The girls, too, have made much progress, though not nearly so much.' (p. 194.)

So it came to pass that punishment was needed no more; the little colony (containing sixteen boys and thirteen girls) was becoming to many of the inmates a true home. The boys might be sent on errands to Bristol; even thievish *girls* could be *trusted* in the village with money, which they never thought of appropriating; and no one ever desired to run away.

Thus the movement went on in spite of disappointments, and two years afterwards Miss Carpenter was able to open a new school in the Red Lodge, Bristol, an ancient Elizabethan house, well adapted for the purpose. Hither came the girls from Kingswood, leaving the boys in full possession, and here Miss Carpenter reigned till her death. But her endeavours were ever stretching out into further efforts. The year 1857, which saw the foundation of the Social Science Association, immediately brought fresh claims upon her attention. Her experiments and investigations were carried on with unflagging spirit, and the results communicated in papers on special points from time to time. From schools she passed to convicts; and these were, in 1864, made the subject-matter of her third book. Two years later her interest in India was powerfully re-awakened, and she resolved to go and see for herself what could be done for the women of that land; without, in the least, relinquishing her work at home, which was to be carried on in her absence on her own plans. In her sixtieth year, and perfectly unattended, she took leave of her brother at Paris in 1866, with her face towards the East. She had now become a person of importance, and the Government of the day regarded her expedition to India as a matter of public interest. On her arrival at Bombay she was astonished to find that the Governor had issued a circular on "Education and Prison Discipline," in which he said:—

'On questions connected with these and other cognate subjects, Miss Carpenter's opinion has, for many years past, been sought and listened to by legislators and administrators of all shades of political opinion in England; and His Excellency in Council looks forward to her visit to Bombay as likely to be of great public benefit, by aiding

in the solution of many problems with regard to which much has yet to be learnt in India, from the results of late European inquiry and discussion." (p. 323.)

Her mission was to Indian women; and to this she soon added its prisoners and youthful criminals. Very little observation convinced her, contrary to her preconceived ideas, that it was practically impossible, at that stage, "to engraft English culture upon Hindu family life." She found the best Girls' Schools *kept and taught by a man*; and she saw at once that, if these girls were to have proper training, women must be at the head.

In 1867 she returned to England, full of gratitude and hope, to take up the work which she had temporarily left in other charge. But her hand had been set to the Indian plough, and there seemed no excuse for looking back. She had already done great good, and there was more opening out to her. It was proved that India wanted her; and to India again she resolved to go, intending to establish a Voluntary Female School at Ahmedabad. In November 1868, she was again at Bombay, and in full activity; but in the following spring her health broke down, and she had to return to England. As soon, however, as her health was re-established, she started on a third journey. She found the school she had commenced progressing under an excellent English teacher, who had 130 pupils. In 1870 she returned to England full of schemes of Prison Reform, both there and in America. But the Bristol that she loved still kept its hold upon her heart; and in 1871, she applied herself to the establishing of a Day Industrial Feeding School for the utterly destitute. In 1873 she again [illegible] chiefly to [illegible] its prisons. In the spring of 1874 she was at home again, in the thick of her work. But her energy was unresting; and in 1875, being then sixty-eight years old, she started once more for Bombay, to see how her schools were getting on and what new help they wanted. In March 1876, she sailed for England. It was the year of Lord Sandon's Act; and she took immense interest in its beneficent provisions, especially the enlarged powers of compulsion and the provision for Day Industrial Schools.

In 1877 the working machinery which had been the pride of her life was completed in Bristol. It comprised :—

Boys' Reformatory School at Kingswood.
Girls' Reformatory School at Red Lodge.
Boys' Certified Industrial School, Park Row.
Girls' Certified Industrial School, in the Fort.
Day Industrial Feeding School, in St. James's Back.
The Children's Agency in St. James's Back.
Workman's Hall and Lecture Room.
Boys' Home.

Did ever woman accomplish a nobler work than these eight institutions? So carefully were they planned, that, though their foundress is gone, they remain in full efficiency, and will remain an untold blessing to thousands of lost children, and a noble monument of a noble life. Her end came suddenly, June 14, 1877. On the evening of that day she lay down to rest, and slept; and "before the dawn she had passed quietly away."—*School Guardian*.

THE TRAINING OF TEACHERS.

By the Rev. R. H. Quick.

(*Continued from page 91.*)

This theory of the educator's task which makes him a dispeser or director of influence rather than a teacher, led Locke to decry our public schools, for in them the traditions and tone of the school seem the source of influence, and the masters are to all appearance mainly teachers. Locke's own words are these:—"The difference is great between two or three pupils in the same house and three or four score boys lodged up and down; for let the master's industry and skill be never so great, it is impossible he should have fifty or a hundred scholars under his eye any longer than they are in the school together, nor can it be expected that he should instruct them successfully in anything but their books; the forming of their minds and manners requiring a constant attention and particular application to every single boy, which is impossible in a numerous flock and would be wholly in vain (could he have time to study and correct everyone's particular defects and wrong inclinations) when the lad was to be left to himself or the prevailing infection of his fellows the greatest part of the four-and-twenty hours." But the educator who considers himself a director of influences must remember that he is not the source of those influences. The boy brought up in private on Locke's system would be entirely without a kind of influence much more valuable than Locke seems to think—the influence of boy-companions and of the traditions of a great school. On the other hand, it cannot be denied that our public schools used [illegible] are still to some extent, under-mastered, and that the masters should not be the mere teachers which, from overwork and other causes, they often tend to become. The consequence has been that the real education of the boys has, in a great measure passed out of their hands. What has been the result? A long succession of able teachers have aimed at giving literary instruction and making their pupils classical scholars. Both manners and bodily training have been left to take care of themselves. Yet such is the irony of Fate that the majority of youths who leave our great schools are not literary and are not much of classical scholars, but they are decidedly gentlemanly and still more decidedly athletic.

We have now arrived at the least practical and at the same time the most influential of all the writers on education—I mean Rousseau. He, like Rabelais, Montaigne, and Locke, was (to use Mr. M. Arnold's expression) a "child of the idea." He attacked scholastic use and wont not in the name of expediency but in the name of *reason*, and such an attack—so eloquent, so vehement, so uncompromising—had never been made before.

"But the tremendous influence exerted by the writings of Rousseau did not arise simply from his superior rhetoric or his superior insight. Words, as we know, depend for their power on the condition of the minds to which they are addressed; and Rousseau found all men prepared to listen to him. It was a time when the nations of Europe were entirely estranged from the old beliefs and were looking about for new. Thought was far ahead of the actual. The framework of society due to the old ideas, though it had already fallen into decay and no one respected it longer, had to be maintained for want of something to replace it. At this time, as Rémusat has said, reality and thought were considered as two things isolated one from the other. In the region of ideas no allegiance was recognized except to reason; and in the facts of daily life no rule was allowed but that of self-interest. In this state of affairs came Rousseau, with his utter disregard of consequences and his power of giving expression to the general discontent and pouring contempt on everything that *is*. In thus giving discontent a voice he immensely increased its force, so much so, indeed, that he has been called the father of the French Revolution. And a more thorough revolutionist than Rousseau never lived. He first obtained celebrity by a prize essay, in which he maintained that civilization, the arts, and all human institutions, were from first to last pernicious in their effects, and that no happiness was possible for the human race without making a clean sweep and returning to what he called the state of Nature. If man had brought himself to a state of misery bordering on despair by following his own many inventions, take away all these inventions, and you will have man in his proper condition. His argument, briefly put, was this—Man was once happy: man is now miserable. Undo all that has been done and man will be happy again.

Rousseau was by no means the first of the reformers who advocated a return to Nature. There has been a prevalent conviction in men's minds from the time of the Greeks onwards that most of the evils which afflict humanity have come from our not following "Nature." The cry of "Everything according to Nature" was soon raised by educationists. Ratke announced it as one of his principles, Comenius would base all action on the analogy of Nature. Indeed there has hardly ever been a system of education which did not lay claim to be the "natural" system. But I have waited till I had to speak of Rousseau, that I might then consider the principle of following Nature in telling you about its most uncompromising advocate. I am afraid I must ask you to give a *rather more close* attention than it is quite comfortable to give, while I try to get at some clear notion of what the Reformers mean by Nature.

When we come to trace back things to their cause we are wont to attribute them to God, to Nature, or to Man. As almost all men have held, God works in and through Nature, and therefore the tendency of things apart from human agency, must be to good. This faith which underlies all our thoughts and modes of speech, has been beautifully expressed by Wordsworth—

> "A gracious spirit o'er this earth presides,
> And in the heart of man; invisibly
> *It comes to works of unreproved delight,*
> And tendency benign; directing those
> Who care not, know not, think not, what they do."*

But if the tendency of things is too good, how is it that they go so much awry? Listen to the same poet. After pointing to the harmony of the visible world, and declaring his faith that "every flower enjoys the air it breathes," he goes on—

> "If this belief from heaven be sent,
> If this be Nature's holy plan,
> Have I not reason to lament,
> What Man has made of Man?"

* Vide *The Prelude* for these lines, and much more in a similar strain.

This passage might be taken as the motto of Rousseauism. According to that philosophy man is the great disturber and perverter of the natural order. Other animals simply follow nature, but man has no instinct, and is thus left to find his own way. What is the consequence? A very different authority from Rousseau, the poet Cowper, tells us in language which Rousseau might have adopted—

> "Reasoning at every step he treads,
> Man yet mistakes his way:
> While meaner things whom instinct leads,
> Are seldom known to stray."

Man has to investigate the sequences of Nature, and to arrange them for himself. In this way he brings about a great number of foreseen results, but in doing this he also brings about perhaps even a greater number of unforeseen results; and alas! it turns out that many, if not most, of these unforeseen results are the reverse of beneficial.

Another thing is observable. Other animals are guided by instinct, we, for the most part, are guided by tradition. Man, it has been said, is the only animal that capitalizes his discoveries. If we capitalized nothing but our discoveries, this accumulation would be an immense advantage to us, but we capitalize also our conjectures, our ideals, our habits, and unhappily, in many cases, our blunders. So a great deal of education which is purely mischievous in its effects, comes not from our own mistakes, but from those of our ancestors. The outcome of these reflections is not very encouraging. It amounts to this, that what with our own shortsightedness, and what with our readiness to go on unhesitatingly in tracks which may have been wrong from the very outset, we are sometimes no more successful in managing our lives and the lives of our children than a youngster is in regulating his first watch, or (if I may be pardoned such an uncomplimentary simile) than a monkey is in experimental chemistry.

The generation which found a mouth-piece in Rousseau had become firmly convinced, not indeed of its own stupidity, but of the stupidity of all its predecessors; and the vast patrimony bequeathed to it seemed nothing but lumber or worse. So Rousseau found an eager and enthusiastic audience when he proposed a return to Nature, in other words, to give up all existing customs, and for the most part to do nothing and let things take their course. His boy of twelve years old was to have been taught *nothing*. Up to that age the great art of education, says Rousseau, is to do everything by doing nothing. The first part of education, he says again, should be purely negative. Let childhood ripen in children. What would you say of a man who, to make the most of his life, would never go to sleep? You would say he lost time by trying to save it. In the same way do not interfere with the appointed sleep of childhood.

We have now reached a climax. Comenius, as we saw, was the first to take a comprehensive view of the educator's task and to connect it with man's nature and destiny, but in practice he thought too much of imparting knowledge. Locke saw that the imparting of knowledge was of trifling importance when compared with the formation of character, but he hardly went so far as this principle would naturally have led him. He was, in fact, much under the influence of social distinctions, and could not help thinking of what it was necessary for a gentleman to know. So that Rousseau was the first to shake himself entirely free from the notion which the Renascence had handed down, that man was mainly a learning animal, and that the chief function of the educator was to communicate knowledge. Rousseau had the courage to deny this in the most emphatic manner possible, and to say, "For the first twelve years the educator must teach the child nothing." And though I am far from denying that there was exaggeration in this paradox, it was perhaps necessary thus to sweep away the ordinary school-room rubbish before the real nature of the educator's problem could be fairly considered. The rubbish having been cleared away, what was to take its place? No longer having his mind engrossed by the knowledge he wished to communicate, the educator had now an eye for something else not less worthy of his attention, *viz.*, the child itself. Rousseau was the first to base education entirely on a study of the child to be educated, and in doing this he became, as I believe one of the greatest of the Reformers.

Let us hear what he says on this subject:—"We do not comprehend childhood, and with our false notions of it the further we go the further we are astray. The wisest of us are always harping on what a man ought to know without considering what children are capable of learning. We are always seeking the man in the child without thinking what he is before he is a man. And this is that I have studied. I may have seen very imperfectly what ought to be done, but I believe I have seen aright the subject on which we have to act." "Childhood," he says again, "has ways of seeing, of thinking, of feeling, peculiar to itself. Nothing is sillier than our wishing to put our own in the place of these." "The art of observing children would be most valuable to us," he says elsewhere, "and at present parents and tutors have not learnt the rudiments of it."

Making this study the base of his educational system, Rousseau did not confine himself to such maxims as "Do nothing and let nothing be done." Indeed, there is plenty of work proposed for the educator, but instead of giving knowledge he is to influence the child's conduct and further, to develop its bodily powers and especially its senses. "If Nature," says he, "has given to the brain of children that *impressibility* which fits it to receive all sorts of impressions, this is not in order that we may mark on it the names of kings, dates, phrases of heraldry, astronomy, geography, and all those words meaningless at that age and useless at any age, with which we over-burthen their sad and sterile childhood; but it is in order that all the ideas which they can conceive and which are useful to them, all those which relate to their happiness and will one day show them their duty, may be early traced in ineffaceable characters and be serviceable to them all their life long."

In his study of children, Rousseau came upon a truth that does not seem to have struck any of his predecessors. From the time of the earliest Innovators, we have seen that "Things not Words" had been the war-cry of a strong party of Reformers. But *things* had been considered merely as a superior means of instruction. Rousseau first pointed out the intimate relation that exists between children and the material world around them. Children had till then been thought of only as immature and inferior men. Since his day a great English poet has taught us that in some ways the man is far inferior to the child, that "the things which we have seen we now can see no more," and

"that nothing can bring back the hour
Of splendour to the grass, of glory in the flower."

Rousseau had not the inspiration of Wordsworth, but he, too observed that childhood is the age of strong impressions from without and that its material surroundings affect it much more acutely than they will in after life. Which of us knows as much about our own house and furniture as our children know? Still more remarkable is the sympathy children have with animals. If a cat comes into a room where there are grown people and also a child, which sees the cat first? which observes it most accurately? Now this intimate relation of the child with its surroundings plays a most important part in its education. The educator may, if so minded, ignore this fact altogether and stick to dates and county towns, but if he does so the child's real education will not be much affected by him. Rousseau saw this clearly, and wished to use "things" not for instruction but for education. By means of things he would aid in the training of all the senses.

I have spent some time upon Rousseau, for I believe he has been the founder of the true science of education. From his time the great writers on the subject have made the nature of children the basis of education, and have treated them first and foremost, not as learners, but as beings who feel, think, act, create.

A man very different to Rousseau was so much influenced by studying this Emile that he resolved to devote himself to education. I mean Pestalozzi.

At first sight there seems little indeed in common between these two men. The one was a vain and somewhat wayward who cared so little for his own views that he sent his children to the Foundling Hospital. The other was a great philanthropist whose sole thought was how he might benefit his fellow-creatures, and who gathered poor children into his house when he was almost as poor as they. And Pestalozzi does not owe his celebrity to his writings, but to his work. He laboured heart and soul for the relief of suffering humanity, and though in middle life he wrote a successful book and became a copious writer afterwards, no one now ever thinks of him as an author. Rousseau is a voice and nothing else.

To what, then, was due the immense influence of Pestalozzi on education? It was due to this, that a clean sweep having been made of the old instruction by Rousseau, Pestalozzi first declared the true theory of the task of the educator. Before Pestalozzi no one had ever risen to the height to such a conception as this (I give his own words):

"Education, instead of merely considering what is to be imparted to children, ought to consider *first* what they already possess, not only their developed faculties, but also their involved faculties, capable of development. Or if instead of speaking thus in the abstract we will but recollect that it is to the Great Author of life that Man owes the possession and is responsible for the use of his innate faculties, the educator should not simply decide what is to be made of the child, but should enquire what was the divine intention respecting it. What is the child's destiny as a created and responsible being? What are his faculties as a rational and moral being? What are the means for their perfection and the end held out as the highest object of their efforts by the Almighty Father of all, both in creation and in the page of Revelation?"

Here you see we have a new point of departure for considering the function of the educator. When once this has been adopted we get a new idea of education. I will give this also in the words of Pestalozzi:

"Education consists in a *continual benevolent superintendence*" observe these most important words, a continual benevolent superintendence with the object of calling forth all the faculties which Providence has implanted; and," continues Pestalozzi, "its province thus enlarged will yet be with less difficulty surveyed from one point of view, and will have more of a systematic and truly philosophical character than an incoherent mass of 'lessons' arranged without unity of principle, and learnt without interest, which too often is called education."

(To be continued.)

"THE HOUSE IS BUILDING."

"I WANT to ask you a question," observed Mr. Parker, as we sat out upon the porch after tea with Mrs. Adeler. "I notice that you always say 'is being done,' and not 'is doing.' Now which is correct? I think you're wrong. Some of those big guns who write upon such subjects think so too. Grind us out an opinion."

"The subject has been much discussed, Bob, and a good many smart things have been said in support of both theories. But I stick to 'is being done;' first because it is more common, and therefore handier, and second, because it is the only form that is really available in all cases. Suppose, for instance, you wished to express the idea that our boy Agamemnon is enduring chastisement; you would say, 'Agamemnon is being spanked,' not 'Agamemnon is spanking.' The difference may seem to you very slight, but it would be a matter of considerable importance to Agamemnon; and if a choice should be given him, it is probable that he would suddenly select the latter form."

"Just so," exclaimed Mr. Parker.

"You say again, 'Captain Cook is being eaten.' Certainly this expresses a very different fact from that which is conveyed by the form, 'Captain Cook is eating.' I venture to say that Captain Cook would have insisted upon the latter as by far the more agreeable of the two things."

"Precisely," said Mr. Parker.

"And equally diverse are the two ideas expressed by the phrases. 'The mule is being kicked' and, 'The mule is kicking.' But it is to be admitted that there are occasions when the two forms indicate a precisely similar act. You assert, I will say, that 'Hannah is hugging.'"

"Which would be a very improper thing for Hannah to do," suggested Mr. Parker.

"Of course it would; but there is an extreme probability that you would indicate Hannah's action under the circumstances if you should say, 'Hannah is being hugged.' It is in most cases a reciprocal act. Or suppose I say, 'Jane is kissing?'"

"And her mother ought to know about it if she is," remarked Bob.

"It is nearly the same as if I should say, 'Jane is being kissed,' for

one performance in most cases presupposes the other. It will not, however, be necessary for you to attempt to prove this fact by practice anywhere in the neighbourhood of the Magruder mansion. If you find it necessary to explain to Miss Magruder my views of this grammatical question, it will be better to confine your illustrations to the case of Captain Cook.

But you can safely continue to say, 'is being built.' Nobody will object to that but a few superfine people who are so far ahead of you in such matters that they will be tolerably sure to regard you as an idiot whichever form you happen to use, while if you adopt the other form in conversation with your unfastidious acquaintances, you will be likely to confuse your meaning very often in such a manner as to impress them with the conviction that your reason is dethroned."—*Max Adeler.*

APPOINTMENTS.

Appointments made by the Director of Public Instruction, between the 16th May and 15th June 1880.

P. Subbrayalu Iyah, 6th Assistant, Rajahmundry College, to act as 4th Assistant.

G. L. Narasimhaiu, 8th Assistant do. do. to act as 6th Assistant.

G. V. Subbroyalu, Head Master Middle School, Bimlipatam, to act as 8th Assistant.

S. Shunnuga Mudelly, Deputy Inspector, Madanapally Range is transferred to the Kurnool Range.

Lakshminarayana Pantulu, Deputy Inspector, Kurnool Range is transferred to the Madanapally Range.

C. Kuppusawmy Iyer, to act as Deputy Inspector, Guntur during the absence of Jagannadha Sastri, on leave.

Padam Ramamiah to be Head Master, *substantive pro tem*, Middle School, Ankapalli *vice* Advaita Brahma Sastri, resigned.

C. Kuppusawmy Sastri, Deputy Inspector of Schools, Chittoor Circle to be Deputy Inspector, Nellore Range.

N. Murugasa Mudaliar, Deputy Inspector of Schools, Ongole to be Deputy Inspector of Schools, Chittoor.

C. Kotaiya Chettiar, Deputy Inspector of Schools, Nellore Range to be Deputy Inspector, Ongole.

Mr. A. Ramachendriah, to be Head Master, High School, Chittoor.

Mr. N. Raghunatha Charriar, B.A., to be Head Master *substantive pro tem*, Madura College.

Mr. C. H. Thumba Pillay, B.A., to be 2nd Master, Madura College, on Rs. 125, rising to Rs. 175, from the date of the closing of the Middle School of Teruvedamaruthur.

S. Subramaniya Iyer, B.A., to be Third Master on Rs. 90, rising to Rs. 120, from the date of the closing of the Middle School of Teruvedamaruthur.

T. A. Ramachendriah to be 4th Master *substantive pro tem*, on Rs. 30, from the date of the closing of the Middle School of Teruvedamaruthur.

M. Ramasawmy Iyer, B.A., acting 2nd Master, Cannanore High School to be 5th Assistant Master, Cuddalore College.

P. Rungasawmy Iyengar, Head Master, Normal School, Trichinopoly, to act as Deputy Inspector, Cuddalore Circle, during the absence of P. Venkataramiah, on privilege leave.

C. Krishnasamy Pillay, 2nd Master, Normal School, Trichinopoly, to act as Head Master.

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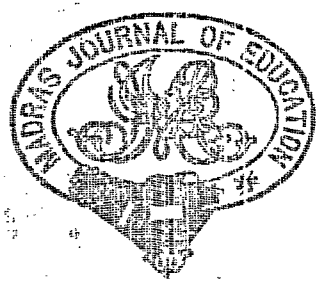

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THE MONTH.

The appointment of a Civilian to the Directorship of Public Instruction, whatever satisfaction it may have given to those Managers of Aided Schools who augur therefrom greater impartiality towards themselves, is universally felt by the Government Educational Department not only as a severe blow against their interests, but as a serious reflection on the efficiency of the Department. While every one allows that if an outsider was to be appointed, no better man could have been found than Mr. Grigg, it is indignantly asked whether there was no man in the Department of sufficient culture, liberality and administrative ability to stand at its head, that the chief prize in the service should for a second time be ruthlessly snatched away from men whose long and efficient services seemed to entitle them to expect it.

We ourselves think that the constant jealousy between the chief officers of the Department and the Aided Educationists has had much to do with the present appointment. An outsider, it has naturally been thought, would be the best man to hold the scales impartially between the contending parties.

Regarding the recent appointment, the Head of an important Government institution writes to us as follows :—

"It is simply a monstrous injustice, and I believe one of the causes is jealousy. The Civilians think the appointment too good

for any uncovenanted man; that in my opinion is the real explanation, and I believe the appointment was not so much made by the Duke as by one or two Members of his Council. Personally I can have no objection to the new Director, but I cannot get over the disgrace and injustice of the Government saying that no man in the Department is competent to discharge the duties of the Director of Public Instruction."

Of the Essays sent in in competition for the Maharaja of Travancore's Malayalam Translation Prize, that by Mr. K. P. Chatu Menon of Madras has been adjudged to be the best.

We learn that the General Assembly of the Church of Scotland in Edinburgh have, after consideration, determined throughout their Indian Missions to continue and extend their operations in the promotion of the Higher Education of Hindus; the consensus of opinion being that Education is one of the most valuable of Missionary agencies among the higher castes of this country. The Established Church of Scotland while continuing their own institution in Madras at its present standard, have determined to subsidize the Christian College to the amount of £600 per annum.

In issuing the last number of *The Student*, an Educational Journal conducted for some time with great ability, the Editor after explaining the circumstances that have led to the demise of his Journal, makes the following remarks:—

"None but those who have had practical experience of the great difficulty of conducting an Educational Journal can possibly imagine the amount of personal toil that the Editor has to undertake—not seldom he has to write half or more than half his journal himself and this, in the pressure of other work, becomes an insupportable monthly burden. Again, the number of subscribers to an educational periodical, like *the Madras Journal of Education* and ourselves, is not, considering the very large school-going population, one tithe of what it should be, consequently there is a perpetual struggle for life, and consequently also the Editor is unable to pay his contributors who, having nothing to gain or lose, soon discontinue their efforts. *The Madras Journal of Education* has fought a long and severe fight for nearly a quarter of a century and is we believe only now beginning to be a profitable undertaking.

The Editor of *The Student* has placed his own services at the disposal of the Editor of *The Journal of Education* as a contributor, and he hopes all those gentlemen who so kindly aided him with their pens will follow the same course and give their best assistance to *The Journal of Education*. By thus concentrating our forces we shall probably be doing students a good turn, as the Editor of *The Journal* will be able to improve its literary contents. We would also urge upon all those who can afford it the desirability of subscribing to *The Journal*, which has considerable claims upon the gratitude of the Educational world for its long and arduous labours."

We need not say that we shall gladly welcome all assistance that our kind friends are disposed to give us. We know that teachers are a hard worked race, and after the school labours of the day, very little inclination as a rule exists for supererogatory work, but if they would occasionally jot down a few of the thoughts that from time to time occur to them while engaged in their school duties, they would confer a great benefit on other teachers, and would make our Journal more practical and useful. Notes on the English Subjects for the Matriculation and First Arts Examinations, and, now and then, Mathematical Solutions would be most acceptable.

As we have before intimated, we hope shortly to be in a position to publish a few remarks on the teaching of Chemistry and Physics that may be serviceable to our readers. In the meantime we recommend to their notice a little book entitled "The Experimental Teaching of Chemistry and Physics, being practical details of the experiments and apparatus illustrative of the Chemistry and Physics Primers, with useful hints as to the manipulation and construction of apparatus," by J. Cook, Esq., M.A., of the Doveton College, Madras.

A course of Lectures on the same subject will be given by C. Michie Smith, Esq., B.Sc., in the Madras Christian College, on Saturday afternoons at 3-30 P.M., commencing on the 24th July. Tickets for admission may be obtained from Mr. P. Yathirajulu, the College writer.

'AYLMER'S FIELD.'

This Poem of Tennyson's is one of the selections for the F.A. Examination of 1880, and on the whole we consider it as good a selection as has ever been made. It is however a very difficult poem for natives to master, owing chiefly to the enormous number of Scriptural allusions contained in the lengthy sermon at the end—there are too *obscurities* of expression and general allusions not a few.

We have before us a little volume of notes* by Mr. J. T. Margoschis. Students who have any real desire to understand their text will do well to supply themselves with these notes, a *careful* study of which

* Aylmer's Field by Alfred Tennyson annotated for Indian Students by J. T. Margoschis, with Questions for Examination. *Madras Journal of Education*.

cannot fail to lead them to a very thorough comprehension of the Poem. Here and there we do not quite agree with the interpretation given, but we are free to confess that we may be wrong in our view and Mr. Margoschis right. At any rate it is not permissible for an annotator to give forth an uncertain sound, or students begin to mistrust him, when perhaps though they do not understand it, two apparently opposite interpretations of a difficulty may be right, but *which* the author meant, he alone can 'resolve' us.

Occasionally where we have found that students cannot grasp the idea we think our annotator too brief—a brevity made up for by many admirable and exhaustive notes. Let us give an example or two,—in line 361 we have the phrase 'the very *whitest* lamb' the note is simply "*i.e.* Edith;" it would have been well we think to bring out the force of the epithet *whitest*; again, in line 696 '*seal'd ear*' the note is "*i.e.* of the deaf;" here we think, for natives, the metaphor contained in the word '*seal'd*' should have been brought out.

The note on l. 849 'the hawk's cast' we think with due deference, is wrong. Perhaps the following quotation from Scott's '*Abbot*,' Ch. IV, para 2, will show as well as a more direct explanation the meaning we attach to the expression.

"What, ho! Sir knave," exclaimed Roland, "is it thus you feed the eyas with unwashed meat, as if you were gorging the foul branches of a worthless hoodiecrow? by the mass, and *thou hast neglected its castinge also for these two days.*"*

For our own part, we should have been sorry to have been without these notes, as until we saw them, line 110 'the tented winter field' we had wrongly explained to mean the 'snow-covered field.' The note is we have no doubt perfectly accurate, and throws full light on a very obscure passage. To sum up briefly, we may say that from a Student's point of view the notes leave little or nothing to be desired.—*The Student.*

* The explanation of "*the hawk's cast*;" given in the published Notes is supported by Latham, who explains "*cast*" as a term in *Falconry* meaning "flight" and gives the following illustrative quotation from Sir Philip Sidney:—

"A *cast* of merlins there was which flying of a gallant height, would beat the birds that rose down into the bushes, as falcons will do wild fowl over a river."
—Ed. M. J. of E.

Results of the University Examinations for 1879—80.

	Calcutta.		Madras.		Bombay.		Total.	
	Registered.	Passed.	Registered.	Passed.	Registered.	Passed.	Registered.	Passed.
Matriculation Examination	2,097	1,069	3,357	1,094	1,936	436	7,147	2,599
First Examination in Arts	1,010	320	497	205	150	71	1,787	696
B. A. Examination	319	112	181	85	97	51	597	248
M. A. Examination	19	10	8	2	6	4	33	16
B. L. Examination	89	47	32	4	29	20	150	71
Honors in Law or M. L.	1	1	2	...	...	...	3	1
First M. B. Examination	29	14	3	2	32	28	64	44
First L. M. S. do.	18	4	6	6	...	...	24	10
Second M. B. do.	17	7	...	...	...	...	17	7
Second L. M. S. do.	111	65	2	2	29	16	142	83
M. D. do.	1	1	...	...	...	...	1	1
B. C. E. do.	5	...	8	5	31	28	44	33
L. C. E. do.	21	...	...	...	19	11	40	11

From Progress.

CIVIL ENGINEERING COLLEGE.

Roll of Candidates who obtained Certificates of qualification as Surveyor and Draughtsman at the Annual Examination of the Civil Engineering College held in May 1880:

Names.	For what Grade.
K. Krishnasawmi Iyer	Surveyor, 3rd Class, D. P. W.
S. Soshiah Rajoo	Do. do.
K. Savery Soondrarumla Pillai	Do. do.
T. M. Sadasivam Pillai	Do. do.
O. Ramakishna Naidu	Do. do.
C. N. Chelvanayagum Pillai	Do. do.
K. Ruthnasawmy Moodelly	Do. do.
A. Pushpanatha Pillai	Do. do.
S. Nataraja Iyer	Draughts. and Estr., 2nd Class.
G. Narayanasawmy Naidu	Do. do. 3rd do.
R. Venkatasyloo Naidu	Do. do. 3rd do.
R. Pushpanathu Pillai	Do. do. 3rd do.
S. Manicka Moodelly	Do. do. 3rd do.
C. Parthasarathy Moodelly	Do. do. 3rd do.
V. Vadevaloo Moodelly	Do. do. 3rd do.
T. Krishnasawmy Naidu	Do. do. 3rd do.
V. Etherajaloo Moodelly	Do. do. 3rd do.
R. Gopalacharry	Do. do. 3rd do.
K. Audisashiah	Do. do. 3rd do.
V. Davasigamoney Pillai	Do. do. 3rd do.

Names.	For what Grade.
L. A. Rungasawmy Iyer	Supervisor, D. P. W.
S. Raghava Iyengar	Do. do.
V. P. Ramaswamy Iyer	Do. do.
T. N. Subramania Iyer	Do. do.
S. Panchanada Iyer	Overseer, do.
P. Moses	Do. do.
P. Srinivasa Iyer	Do. do.
B. Vaikunta Baliga	Do. do.
S. Hearne	Do. do.
S. V. Gnanamuthu	Do. do.
V. Virasawmy Iyengar	Do. do.
C. N. Subramania Iyer	Do. do.
V. Aravamuthu Iyengar	Do. do.
S. Subramania Iyer	Do. do.
M. Srinivasagam Pillai	Do. do.
B. V. Abraham	Do. do.
C. Venkataramiah Naidu	Do. do.
L. S. Sabapathy Iyer	Do. do.
C. J. Lears	Do. do.
G. Eapen	Do. do.
K. Parthasarathy Iyengar	Do. do.
M. A. Terunarayana Chari	Do. do.
C. Subroya	Do. do.

THE PROFESSOR AND THE ECHO.—The *Madras Mail* is indebted to our facetious local contemporary, *Gup and Gossip*, for the following :—

A rather comical story is going the round of scholastic circles here, the hero, or more correctly perhaps, the victim of the tale being a Professor of the Madras University. We will not say it is Mr. Wilson of physical science notoriety. Well, the story runs that one afternoon, after work, the students of his class, went to the Professor and began to relate to him a wonderful superstition which, though unaccountable, was beginning to gain ground among the students of the Presidency College. They said that many believed the College to be haunted and that the cellars were the abode of the spirits of departed masters, and that a candidate for University honors had only to seriously and with a believing frame of mind ask these spirits in the cellars, through the gratings in the passages, whether he would succeed or not, and an answer would be vouchsafed to his question. Strange to say these replies from the spirit-world were never known to prove incorrect. Many students had actually found out, before hand, in what class they would be placed; and some candidates who had every probability of passing, had been known to stay away altogether from an examination which they had found out previously would prove to be of no good to them.

"After pooh-poohing the story and expressing his regret that his students should be so silly as to entertain a belief in such absurd ideas, the Professor, however, consented to examine this wonderful mystery. He was accordingly led by his pupils into one of the larger passages of the building, the greater portion of the College students waiting with apparent interest the result of the impending investigation. A small grating in the floor was then removed and the Professor was asked to make an enquiry,—say the usual enquiry, —'Shall I pass?' The Professor seriously knelt down, then stretched himself full length on the ground and applying his mouth to the opening sung out boldly the mystic question, 'shall I pass?' There was silence for a second, then the echoing vaults replied loud and clear—'ass.' "The Professor felt a cold chill rush up his back, he lay motionless for a moment, and then jumped up from his dignified position, like one shot, to discover that he was alone, the crowd of students having disappeared as in a dream, and to hear the irritating sound of half suppressed laughter rising from the play ground."

CORRESPONDENCE.

THE MATRICULATION POETRY SUBJECTS.

A HEAD MASTER writes to us as follows :—

"I have gone with my class more than half way through Tennyson's *Gardener's Daughter*, and I must say I wonder, nay I am lost in wonderment, at the Syndicate's choice. It is quite one thing to sit in one's chair and read an *amatory* poem, quite another to have to teach it. Native students want to dive deeply into the meaning of every line and expression, and I only wish that I could be behind the scenes and hear the grave and reverend signiors of the Syndicate expounding minutely lines 136—140 of *The Gardener's Daughter* to a large class of Native students.

Really it is beyond everything that we should have to teach, pure though they be, amatory poems to natives. Undoubtedly to the 'pure all things are pure,' but (excuse the pun) what can one make out of such a passage as I have quoted but pure nonsense? Is the Syndicate as a body in love, or whence this nympholepsy? I admire Tennyson in his sane moments as much as any man living, but the old gentleman is sometimes very incoherent, and not seldom *sensuous* to a degree. There are passages in the Idylls which are not fit *for teaching*, and however fit for B. A.'s the *Gardener's Daughter* may be, it is simply preposterous to set it for would be matriculates. Are we to have more of Tennyson's amatory ditties in the coming list of selections? I cannot understand how men accredited with common sense can think of setting such *wooden* poems as the '*Parting Hour*' and such *warm* ones as the '*Gardener's Daughter*.' This leads me to say a word about the *Parting Hour*. It is the merest rubbish, such in fact as any decently educated man could turn out *by the yard*. The story is all very well, but the poetry! Heaven save the mark! The rhymes are evidently forced, and to them, very often, both sense and grammar are sacrificed."

NOTES ON TRIGONOMETRY.

[*N.B.*—The following Solutions are different from those given in Todhunter's Key to his Trigonometry. The student may advantageously compare them.]

I. Prove that $\sin 3A \operatorname{cosec} A - \cos 3A \sec A = 2$ (Chap. VI. Ex. 4).

$$\frac{\sin 3A \cos A - \cos 3A \sin A}{\sin A \cos A}$$

$$= \frac{\sin (3A - A)}{\sin A \cos A} = 2.$$

II. Prove that

$$(\cos A + \cos B)^2 + (\sin A + \sin B)^2 = 4\cos^2 \frac{A - B}{2}$$

(Chap. VII. Ex. 16).

$$4\cos^2 \frac{A+B}{2} \cos^2 \frac{A-B}{2} + 4\sin^2 \frac{A+B}{2} \cos^2 \frac{A-B}{2}$$

$$= 4\cos^2 \frac{A-B}{2}.$$

III. Find the limit of the expression $\left(\frac{x-1}{x}\right)^x$ when x is indefinitely increased (Chap. X. Ex. 42).

$$\left(\frac{x-1}{x}\right)^x = \left(1 - \frac{1}{x}\right)^x = 1 - 1 + \frac{x(x-1)}{|2} \cdot \frac{1}{x^2} - \&c.$$

$$= 1 - 1 + \frac{1}{|2} - \frac{1}{|3} + \&c. \text{ ultimately} = e^{-1}$$

IV. If the expression $\frac{A \cos(\theta + \alpha) + B \sin(\theta + \beta)}{A' \sin(\theta + \alpha) + B' \cos(\theta + \beta)}$ retain the same value for all values of θ, then will $AA' - BB' = (A'B - AB') \sin(\alpha - \beta)$. Put $\theta = -\alpha, -\beta$ successively, and equate.

$$\frac{A - B \sin(\alpha - \beta)}{B \cos(\alpha - \beta)} = \frac{A \cos(\alpha - \beta)}{A' \sin(\alpha - \beta) + B'}$$

$$AA' \sin(\alpha - \beta) - A'B \sin^2(\alpha - \beta) + AB' - BB' \sin(\alpha - \beta)$$

$$= AB' \cos^2(\alpha - \beta)$$

$$(AA' - BB') \sin(\alpha - \beta) = (AB' - A'B) \sin^2(\alpha - \beta)$$

V. ABC is a triangle of which C is an obtuse angle. Shew that tan A tan B is less than unity (Chap. XIII. Ex. 9).

$$\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$$

Here tan (A + B) is positive; hence 1 − tan A tan B is positive, that is, tan A tan B is less than 1.

VI. The centres of the three escribed circles of a triangle are joined: Shew that the area of the triangle thus formed is $\frac{abc}{2r}$ (Chap. XVI. Ex. 34)

Let O_1, O_2, O_3 be the centres opposite to A, B, C respectively.

The area of $O_1 O_2 O_3$

$$= \tfrac{1}{2} \times AO_1 \times O_2 O_3$$

$$= \tfrac{1}{2} \times AO_1 \times \frac{BO_2}{\cos \frac{C}{2}}$$

$$= \tfrac{1}{2} \times \frac{ra \cdot b}{\sin \frac{A}{2} \sin \frac{B}{2} \cos \frac{C}{2}}$$

$$= \tfrac{1}{2} \times \frac{ab \cos \frac{C}{2}}{\sin \frac{A}{2} \sin \frac{B}{2}}$$

$$= \frac{abc}{2r}.$$

(To be continued.)

LA SHASTRA.

COLLEGES AND SCHOOLS.

FROM Colonel R. M. MACDONALD, Director of Public Instruction, to the Chief Secretary to Government, dated Madras, 24th March 1880, No. 1241-P.

In paragraph 7 of my letter, No. 1648, of the 1st August 1872, submitting certain proposals for remodelling the Madras Normal School, I made the following remarks:—

"I also agree with Mr. Fowler in thinking that a far better class of men would present themselves for admission into the normal school, if they could enter it with definite prospects of a gradual rise. In all professions young men are willing to commence with small salaries, if they see that industry, good conduct, and long service lead to increased emoluments as they advance in life. The Educational Department, as at present constituted, differs from many other departments. The prospects of promotion, in a large number of cases, are very small. There are at this moment masters who are drawing the same or nearly the same salaries as when they first entered the department fifteen years ago. A head master of a taluk school cannot be placed at the head of a zillah school, merely because he has done his duty faithfully for a great number of years. He must possess certain qualifications, and if he has not acquired the necessary attainment as a young man, he is never likely to acquire them in after life. Judging from what is going on in every other department, I have not the smallest doubt that there are already a large number of Graduates, and a still larger number of men who have passed the First Examination in Arts, who would willingly enter the Educational Department on salaries of Rs. 30 or Rs. 40 if they saw before them the prospect of a gradual rise to, say, Rs. 250 in the former case and Rs. 150 in the latter. An enormous impulse might be given to middle-class education, which is now in a very

unsatisfactory position by the appointment of young men of this class as *head masters* of taluk and Anglo-Vernacular schools, and if they knew that they were graded in classes, and could rise by seniority, provided certain results were annually produced in their schools, many of them would probably settle down to their work, and some of that feverish desire to enter some other department, which does so much mischief to our schools, would disappear."

2. These views were approved by Government in paragraph 6 of G. O., No. 286, of the 5th October 1872, from which the following extract is taken :—

"The remarks made by Lieutenant-Colonel Macdonald in the 7th paragraph of his letter are very just. The want of a regular system of promotion, such as obtains in almost every other department, is a great drawback. In other branches of the public service, young men of good attainments enter on low salaries, induced by the prospects of promotion which are open to them. The Educational Department is, for various reasons, less popular than other departments of the Administration in which there is more scope for the exercise of power and influence, and until quite recent years it would have been impossible to obtain for the subordinate situations, such as the masterships in taluk schools, or the junior masterships in zillah or provincial schools, men whose attainments were such as to qualify them for eventual promotion to the higher posts of the department. But now that the supply of educated natives is so greatly increased the case is altered, and the Government are of opinion that the arrangement advocated by Lieutenant-Colonel Macdonald may probably be carried out with very great advantage."

3. The scheme for remodelling Government middle schools, which was sanctioned in G.O., No. 132, of the 12th April 1876, was based on the principle of grading the masters in classes, with salaries rising from a minimum to a maximum by regular increments. The same principle has been since applied to the Madrasa-i-Azam, to the mofussil normal schools, and to the second-grade high schools at Chicacole and Cannanore (*vide* G.O., No 111, of the 20th March 1877, No. 113, of the 7th April 1879, No. 332, of the 8th July 1878, and No. 251, of the 23rd June 1879), and to several appointments which have been recently sanctioned in Government colleges.

4. The annual reports on Public Instruction show that the Government middle schools, which used to be in a most unsatisfactory state, have greatly improved. Many of them, in the comparative examinations, actually surpass schools of a much higher character. Several of them are working beyond their nominal standard, third-grade schools doing the work of second-grade schools, and second-grade schools of first-grade schools, while two first-grade middle schools have been allowed to have a Preparatory Matriculation Class. At Chicacole the middle school has been formally constituted a second-grade high school, and has commenced sending up pupils to the Matriculation Examination. Several pupils have just passed the Middle-school Examination, not only from first-grade *middle* schools, but even from second-grade middle schools.

5. It is now proposed to remodel the first-grade high schools and second-grade colleges on the same general principles.

6. Originally a high school consisted of six classes, the sixth or highest being the Matriculation Class, and the first or lowest being one in which no instruction in English did not rise beyond the First Book of Lessons. The Committee for the revision of text-books recommended that the course should be lengthened by one year, as the transition from the third to the fourth class was too abrupt. Mr. Powell acceded to this recommendation, but as he considered it undesirable to alter the numbering of the classes, he directed the fourth class to be split into two classes, called the upper and lower fourth. An additional master on rather high pay was needed for this class, but Mr. Powell met this difficulty by abolishing the first class, and directing that the master of the first class should take charge of the second, and so on, up to the upper fourth. Many of the assistant masters in high schools are accordingly receiving very low salaries for the work which they are doing, and inferior men are in consequence entertained and in course of time promoted. For Rs. 15 or Rs. 20 it is difficult to get any one superior to a Matriculate, and if a man of this class enters a high school, he naturally looks for promotion sooner or later. Experience, however, shows that the knowledge of English possessed by Matriculates is often so imperfect that the pupils learn bad English from them. The time has, I think, come for getting rid of men of this class in the middle departments of high schools. I propose, therefore, making the third class the lowest class of a Government high school, which will thus contain a high and middle department, but no upper or lower primary department, except in certain cases to which I shall refer presently. The salary of the master of this class should, I think, be the same as that given in Government middle schools, viz., Rs. 30 rising by biennial increments of one rupee to Rs. 35. For this salary it is quite possible now to get First Arts men, and I would lay it down, as a general rule, that no assistant master should, in future, be entertained or promoted who had not passed the First Examination in Arts. The salaries of the masters of the lower and upper fourth class would, as in Government middle schools, be Rs. 40 rising to Rs. 50, and Rs. 60 rising to Rs. 80 by biennial increments. The second master receives now a salary of Rs. 100. This I would change to Rs. 90, rising to Rs. 120 by biennial increments. The head master receives Rs. 200, rising to Rs. 300 by annual increments. I propose to make the increments biennial instead of annual. The latter, under the Financial Code, represents an average salary of Rs. 275, the former of Rs. 262 8-0, and in six schools this item represents a saving of Rs. 75 for the changes proposed

7. In most schools there are double divisions of some of the classes. Provision is accordingly made for more than one master in certain grades of certain schools.

8. High schools of the first grade are located in towns in which provision has been made or may be made for primary English schools maintained by Local Fund Boards and Municipalities. Wherever such provision does not exist, or wherever the existing Municipal or Local Fund school is not found to be an efficient feeder to the high school, it is proposed that such primary English classes as may be needed shall, with the sanction of the Director of Public Instruction, be established in connection with the Government school and in the same building. These classes would be regarded as constituting an unaided school under inspection. The masters would be selected and appointed by the Inspector, but they would receive no remuneration except the fees of their pupils. They would be under the control of the head master and be bound to abide by all the rules of the school. On the other hand, they would have the use of a room or verandah, and of such school furniture, maps, text-books, &c., as might be needed. If trained First Arts men were found willing to conduct these classes, it would be open to the Inspector to promote them in the high school when opportunities occurred. If the posts were filled by trained Matriculates, they would be available for employment in Government middle schools.

9. At Cuddapah and Kurnool there are at present three Mahomedan masters on Rs. 30, 20, and 15. The classes taught by them are primary classes, and it is not desirable that this arrangement should be disturbed. The number of boys in each class is usually small, and as they pay only half fees, these classes cannot possibly be rendered self-supporting. It is proposed to give these masters the same increments as masters in middle

schools. At Chittoor, where there are only two masters on Rs. 30 and 15, an additional master on Rs. 20 is provided. First Arts men cannot, of course, be expected, as a general rule, for these posts.

10. All the high schools, except Saidápet, have been recently provided with a writing master, who is also clerk and librarian, on a salary of Rs. 15. Provision is now made for a writing master at Saidápet and it is proposed to give all the writing masters salaries rising from Rs. 15 to Rs. 17½. The writing master will usually be a trained Matriculate, and must look for promotion in middle schools.

11. The Committee for the revision of text-books recommended that provision should be made for the study of Sanscrit in all high schools. Government expressed their unwillingness to allot any additional funds for this purpose, and all that seems feasible is to allow Sanscrit to be taught, if it can be done without any extra expense. It is a moot question whether Pundits should or should not be employed in high schools. In some high schools Pundits are employed. In others the vernacular is taught by the regular class masters. It is, of course, more economical to employ a Pundit on a comparatively low salary than a master who is drawing much higher pay. A Pundit is equivalent to an additional regular master, as if he is employed for five hours in teaching classes, the masters of these classes become available in turn for other work. A salary of Rs. 20, rising to Rs. 25, seems sufficient for the Pundit of a school of this grade. If the services of a Sanscrit scholar can be obtained for this salary, the Pundit should, I think, be a Sanscrit Pundit. If not, a Vernacular Pundit should be appointed, but he need not necessarily be a man who has received no general education.

12. A gymnastic teacher on Rs. 12 has been sanctioned for Cuddapah and Kurnool, and Government have directed that gymnasia shall be established as opportunities occur in connection with all high schools. I have provided a gymnastic teacher for all the high schools, and the cost will be met, as directed in G. O., No. 339, of the 6th September 1879, by a small fee, which will be levied not only from the pupils of the high school, but from the pupils of any other schools in the town who may wish to make use of the gymnasium.

13. The salaries of the school peons range from Rs. 5 to 7. These salaries were fixed many years ago when the necessaries of life were cheaper than they are now. I think that Rs. 6 may be fixed as a uniform rate, except at Saidápet, where there is a peon on Rs. 7 and a gardener on Rs. 5. The present cost of scavengers and sweepers ranges from Rs. 4 downwards. I propose leaving these items as they are for the present.

14. All the high schools receive an annual allowance of Rs. 100 for prizes and Rs. 100 for the library. No change is proposed in these allowances.

15. All have now a contingent allowance of Rs. 10 for stationery and petty expenses. At Pálghat, where the school is held in a shed, there is a special allowance of Rs. 2 for plastering the floor with cow-dung. All the other schools, except Chittoor, are provided with buildings. At Chittoor Rs. 35 is allowed for rent. No change is proposed in any of these items.

16. I now pass on to the second-grade colleges. All these are now doing the same work, viz., preparing pupils for examination up to the F.A. standard, but they are very differently constituted. The colleges at Mangalore, Calicut, and Bellary, were formerly known as provincial schools, and such schools were originally intended to develop into institutions teaching up to the B.A. standard. The salary of the head master in schools of this class was, therefore, fixed at Rs. 500, and a stronger staff of assistant masters was given than that allowed for the old zillah schools. But although a curriculum going up to the B.A. degree was formally laid down for these schools in 1858, it has never been carried out in any provincial school, except those at Kumbakónam and Rajahmundry, which have since been constituted first-grade colleges. From time to time the question of raising the standard of the provincial schools has been discussed, but the change has never been carried out. If men like Mr. Porter and Mr. Metcalfe could be placed at the head of these institutions, and if a somewhat better staff of assistants could be sanctioned, I have but little doubt that the work which has been done at Kumbakónam and Rajahmundry could also be done at Calicut, Mangalore, and Bellary. Mr. Porter and Mr. Metcalfe both drew for many years Rs. 500 a-month, the salary of the head master of a provincial school, and men capable of treading in their footsteps could probably be attracted from Europe for this remuneration. This, I think, should be done as opportunities occur. I do not therefore, recommend that any change be made in the salaries of these head masters.

17. The Berhampore, Salem, Cuddalore, and Madura Colleges were until recently high schools, and no change as has yet been made in the position of the head masters. I consider that the salaries of the head masters of these minor colleges should be ultimately fixed at Rs. 300, rising by biennial increments of Rs. 20 to Rs. 400. These posts should, I think, be reserved for East Indian and Native Graduates, who have distinguished themselves as head masters of high schools, assistants in colleges, and Deputy Inspectors. Such men will, of course, not be equal in some respects to gentlemen who have taken high honors at home, but the country cannot afford to pay the salaries which are necessary to secure the services of such men, and it is besides desirable that there should be some posts of this kind to which deserving men can be promoted. I am not, however, at present in a position to show how even this moderate increase of salaries can be provided, and I have, therefore, left these salaries as they are. I may, however, remark that the persons who are now head masters of these colleges have not been specially selected for the posts which they are filling. They happened to be head masters or acting head masters of certain high schools, and have in this way found themselves head masters of colleges. All of them are, as it were, on probation, and the result of the experiment will not be fully known for a year or two.

18. The second master of each of the old provincial schools of Bellary Mangalore, and Calicut receives a salary of Rs. 150. The same salary was assigned to the second master of the Berhampore College, when the high school was raised to a college. At Salem and Madura a salary of Rs. 125, rising to Rs. 175 by biennial increments of Rs. 10, has been sanctioned. I propose fixing all the salaries of the second Masters at this rate. Those men who are now receiving Rs. 150 will go on receiving this amount until they become entitled to increments, and at Cuddalore Mr. Dique, who under G. O., No. 38, of 1st February 1879, draws Rs. 120, will continue to draw this lower rate of pay as long as he remains in the post.

19. The third master, who has mainly charge of the Matriculation Class, and thus does, as a teacher, the same work as the head master of a high school, receives now Rs. 100 in all the colleges. It is proposed to fix his salary at Rs. 90, rising by biennial increments of Rs. 6 to Rs. 120. In some large colleges there are two parallel divisions of the Matriculation Class, and in such cases there ought to be two masters on Rs. 90, rising to Rs. 120, but I am unable to propose this at present owing to want of funds.

20. The fifth, upper fourth, and lower fourth classes should be taught by Graduates drawing Rs. 60 to Rs. 80 and Rs. 40 to Rs. 50. In some of the colleges there are double divisions of these classes. I have endeavoured to provide the number of teachers required, but I have, in some instances, been compelled to place in the lower of these grades teachers, who, if funds were available, would have been placed in a higher grade. It is proposed that no master shall hereafter be appointed or promoted to any of these posts who is not a Graduate.

21. In some of the colleges there is already no class lower than the lower fourth. In cases in which lower classes are necessary, it is proposed that they shall, except in one special case, be placed under masters holding the same position as the masters referred to in paragraph 8. Such classes will thus be maintained without any expense to Government, and the teachers, who will be First Arts men and Matriculates, will have no claim to appointments in the college, although they will, if they are trained, and if they do their work well, be eligible for posts elsewhere.

22. The special case to which I have referred is the Uriya Department of the Berhampore College. There have been hitherto four masters on Rs. 50, 30, 20, and 15 employed in the middle and primary Uriya classes. It is proposed to give the last three men the same increments as they would get in a third-grade middle school, and to make the salary of the first one a salary rising from Rs. 40 to Rs. 50, the present incumbent continuing to draw the maximum which he receives now.

23. It is proposed to allow two Pundits to each college,—one on Rs. 30 rising to Rs. 35, and one on Rs. 20, rising to Rs. 25. Of these one will usually be a Sanscrit Pundit and the other a Vernacular Pundit. At Madura provision is made for one Mahomedan teacher. At Cuddalore where the attendance is small, only one Pundit is provided.

24. The Bellary College has a gymnastic teacher on Rs. 20. It is proposed to have one on the same salary at Calicut and Mangalore. At Berhampore the gymnastic teacher receives Rs. 15, at Salem and Madura Rs. 12. It is proposed to raise the pay of both to Rs. 15, and to appoint one on Rs. 15 at Cuddalore. As in the high schools, it is expected that the salary of the gymnastic teachers will be covered by the extra fees which are now charged in all institutions in which gymnasia have been established.

25. The salary of the writing master, who is also clerk and librarian, is Rs. 20 in four cases and Rs. 25 in the others. It is proposed to make the rate uniform, the salary being fixed at Rs. 20 rising by biennial increments of a rupee to Rs. 25.

26. It is proposed to leave the charges for servants as they are for the present with the following exception. At Bellary it is proposed to substitute a night watchman on Rs. 5 for a meachee on Rs. 10, and to spend the difference in raising the pay of the peons at Berhampore, Cuddalore, and Salem, from Rs. 5 and 5½ to Rs. 6.

27. The Bellary, Mangalore, and Calicut Colleges have an allowance of Rs. 20 per mensem for contingencies. The other colleges have only Rs. 10, the amount drawn by the high schools. The three first-named colleges receive Rs. 200 a-year as a library allowance, and Rs. 150 a-year for prizes. In the other colleges these allowances are fixed at Rs. 100, as they are in high schools. Owing to the want of funds I am unable to propose any increase in the library allowance and prize allowance in the four minor colleges, and can only suggest an increase of Rs. 2-8-0 to the allowance for contingencies.

This gives a gross average increase of Rs. 144, from which must be deducted the increase arising from the salaries of gymnastic teachers, viz., Rs. 109, which will be covered by fees. The net increase is therefore Rs. 35. Against this may be set the following savings :—

	Rs.	A.	P.
Savings already effected in connection with proposals for the entertainment of writing masters in colleges and high schools sanctioned in G.O., No. 335, of the 6th September 1879	1	11	0
Savings already effected in connection with the abolition of the Middle Schools of Tindivanam and Purushottapur sanctioned in G.O., No. 226, of the 8th June 1878	35	10	0
	37	5	0

30. In conclusion it may be remarked that no masters will be thrown out of employment under this scheme. The Matriculates, who are not required in high schools, will be gradually transferred to posts of equal emoluments in middle schools, and those First Arts men, who are not required in colleges, will be transferred as opportunities occur to high schools, normal schools, and middle schools.

No. 21. ORDER THEREON, 18th May 1880, No. 163.

His Grace the Governor in Council approves and sanctions the Director's proposals to remodel the first-grade colleges on the general principles explained by him.

2. The financial effect of the proposals is detailed in paragraph 29 of the Director's letter.

There are seven second-grade colleges.* Their average present cost is Rs. 7,181-10-8. Average proposed cost Rs. 7,353-11-3. Increase per mensem Rs. 169-1-0.

* Bellary, Calicut, Mangalore, Berhampore, Cuddalore, Salem, and Madura.

There are six† first-grade high schools. Their average present cost is Rs. 4,124-8-0. Average proposed cost Rs. 4,099-7-0. Decrease per mensem Rs. 25-1-0.

† Cuddapah, Kurnool, Saidápet, Chittoor, Tellicherry, and Pálghat.

The aggregate average present cost for both colleges and schools is Rs. 11,309-2-8. Proposed Rs. 11,453-2-8. Increase Rs. 144 per mensem, from which the increase of Rs. 109 for gymnastic teachers, to be covered by fees, being deducted, the net increase is not more than Rs. 35, which will be met from the savings specified aggregating Rs. 37-5-0.

3. No masters will be thrown out of employment.

(True Extract.)

R. DAVIDSON,
Chief Secretary.

EXAMINATIONS FOR TEACHERS.

The Departmental Examinations laid down in the Educational Grant-in-aid Code will be held on Wednesday the 8th December next, and following days, at the following stations :—

Russellkonda.
Berhampore.
Chicacole.
Vizagapatam.
Rajahmundry.
Narsápur.
Masulipatam.
Kurnool.
Bellary.
Cuddapah.
Nellore.
Madras—Senate House, Evangelistic Hall, Wesleyan Mission Day School, Popham's Broadway, Presentation Convent (Pay School) Armenian Street.
Cuddalore.
Vellore.
Chittoor.
Salem.
Oosoor.
Kumbakónam.
Negapatam.
Tanjore.
Trichinopoly.
Coimbatore.
Madura.
Dindigul.
Ramnad.
Palamcottah.
Sawyerpuram.
Sachiapuram.
Edyenkudi.
Nazareth.
Pálghat.
Calicut.
Tellicherry.
Cannanore.
Mangalore.
Ootacamund.

2. The examinations will be conducted in the order of time and subjects shown below :—

Dates.	Hours.	Higher Examination of Women.	Special Upper Primary Examination.	School Managment.	
				First, Second, and Third Grade Schoolmasters, and First Grade Schoolmistresses.	Fourth Grade Schoolmasters and Second Grade Schoolmistresses.
6th December ...	10 —12½	Arithmetic	Arithmetic	.....	.....
6th do. ...	12½ — 1	English Dictation	English Dictation	.....	.....
8th do. ...	2 — 4	Geography	Geography	.....	.....
8th do. ...	4 — 4½	Vernacular Dictation	Vernacular Dictation	.....	.....
9th do. ...	10 — 1	English Prose and Poetry (Matriculation Text Books)	English Poetry (Selections No. I) Two hours	.....	.....
9th do. ...	2 — 5	English Grammar and Language, Reciprocal Translation (*or* Paraphrase and Composition)	English Grammar and Composition. Two hours	.....	.....
10th do. ...	10 — 1	Vernacular Prose and Poetry (Matriculation Text Books) ...	Vernacular Poetry (Text Books, prescribed in the Code). Two hours.	.....	.....
10th do. ...	2 — 5	Vernacular Grammar and Composition ... Two hours...	Vernacular Grammar and Composition. Two hours... ...	.....	.....
11th do. ...	10 —11½	Indian History	Indian History	.....	.....
11th do. ...	11½— 1	Needle-work	Needle-work	.....	.....
11th do. ...	2 — 3½	English History	Hygiene	.....	.....
11th do. ...	3½— 5	Hygiene	Agriculture	.....	.....
13th do. ...	10 —12	History of English Literature	.....	Methods of teaching and art of oral teaching. Registers, returns, notes of lessons, organization, and discipline.	Methods of teaching and art of oral teaching. Registers, returns, notes of lessons, organization, and discipline.
13th do. ...	2 — 4	.....	.....	.....	.....
14th do. ...	10 —11½	Botany	.....	.....	.....
14th do. ...	11½— 1	Geology	.....	.....	.....
14th do. ...	2 — 3½	Chemistry	.....	.....	.....
14th do. ...	3½— 5	Physics	.....	.....	.....
16th do. ...	10 —11½	Mathematics	.....	.....	.....
16th do. ...	11½— 1	Astronomy	.....	.....	.....

3. Female candidates who have passed the Middle School examination, first class, or who are going to appear at the next Middle School examination will be examined in needle-work on the 11th December from 11½ A.M. to 1 P.M.

4. The following fees must be paid into a Government Treasury. The Treasury Officer's receipt must accompany the application for admission to the examination. No fees will be received in the Director's Office :—

Higher examination of women	Rs.	5	0 0
Special Upper Primary Examination, male and female candidates	„	3	0 0
School management, male and female candidates.	„	1	0 0
Needle-work (Middle School candidates)	„	0	8 0

5. The Special Upper Primary examination is open to all candidates, and is not restricted, in the case of male candidates, to Normal Students.

6. The students of the Madras Normal School will have to pay the same fee and to undergo the same examination in school management as all other candidates.

7. Applications for admission must reach the Director's Office at Madras on or before the 30th September. They must be prepared in the annexed form, but no printed copies of this form are kept for distribution, nor is there any rule requiring printed forms to be used.

8. Applications defective in any particular will be left unnoticed. In all other cases the candidate will be informed that his or her application has been received and registered.

R. M. MACDONALD,
Director of Public Instruction.

Office of Director Public Instruction,
Madras, 29th June 1880.

Form of Application for the Admission of a Candidate to Examination.

Name of Candidate (To be written in full).	Name of School to which attached.	Whether a Pupil or a Teacher in the same.	Town or Village in which such School is situated.	Station at which the Candidate desires to be examined.	Language and optional Subjects in which the Candidate desires to be examined.	Test for which the Candidate applies.	Nature of Examination, University or other, which the Candidate may have already passed.	Year of such Examination.

NOTE.—Madras Candidates should state whether they wish to be examined at the Senate House, Evangelistic Hall, Wesleyan Mission Day School, or the Presentation Convent.

LATIN AND THE MEDICAL PROFESSION.

At the last meeting of the Senate of the University of Madras, a measure was carried by a majority of the members of the Senate, including a large number of the doctors, which measure, we think, cannot, but be characterised as a retrograde step in the encouragement of the higher education, which the University of Madras professes prominently to keep in view. The measure to which we allude is no less than the omission of the Latin language, as one of the tests in the Preliminary Scientific Examination for the degree of Licentiate of Medicine and Surgery, or the degree of Bachelor of Medicine. We read in our contemporary's report, that 'the recommendation of the Syndicate to make Latin as a subject for the Preliminary Scientific Examination was moved by Mr. Thompson, in the absence of Dr. Furnell, and carried by a majority. Dr. Bidie thought that for writing prescriptions a knowledge of Latin should be insisted upon, as in the case of a B.A. degree candidate going up for his degree in Medicine. The Vice-Chancellor (Sir Charles Turner) did not agree with Dr. Bidie, and said that he did not think a knowledge of Latin was necessary for a candidate going up in Medicine. Such a measure would throw obstacles in the way of candidates.' It is surprising how men of natural abilities and matured attainments like Sir Charles Turner, Mr. Thompson, Principal of the Presidency College, Dr. Furnell and other well known members of the Madras medical profession can have advocated and actually carried so retrogressive a measure as eliminating the test in the Latin language in an examination in which it is specially necessary that the candidate *should possess* a fair knowledge of that language. Dr. Bidie seems to have been one amongst the few who wisely saw the inadvisability of the step and spoke against its adoption. Our contemporary's report states that Dr. Bidie said that for writing prescriptions a knowledge of the Latin language should be insisted upon; we cannot tell whether Dr. Bidie's remarks have been fully reported, but we certainly go further than his words imply. We think that a knowledge of the Latin language in a medical man would not only be useful when he writes prescriptions, but it is also necessary, nay, essential, in the study of Medicine and Surgery. Our proposition is so almost self-evident, that it is hardly necessary to enter into a categorical proof of it. Since, however, a majority of the men of the education and standing of the Fellows of the University of Madras have entertained a different opinion, and have carried that opinion into practical effect, we think it would not be out of place if we ventured to give expression to our own opinions on the subject. We think that the very sciences which a medical man is called upon to study closely before entering on the pursuit of his profession, require a fair knowledge of the Latin language, in order to facilitate their acquisition Zoology, Botany, Physiology, Hygiene, Chemistry, in short, all the sciences and their various branches and sub-divisions which a medical man is compelled to study, are full of words, terms, phrases, and expressions delivered from the Latin and Greek languages, especially the former, the full force and meaning of which it is difficult to understand, without a decent knowledge of those languages a knowledge which will also aid the student in retaining in his memory

those more abstruse portions of the sciences which are remembered by a sort of *memoria technica*, the terms and expressions in the Latin or Greek language giving the key to the meaning and definition of the particular science itself. It is hardly necessary, in this place, to enter into details to explain what we mean. It will be obvious, on reflection, that between two students, the one possessed of a knowledge of the Latin language, and the other not, the former will experience a greater facility in acquiring at least a theoretical knowledge of the sciences of Medicine and Surgery than the latter. We have no hesitation in maintaining that, in this question, Dr. Bidie and the small minority with whom he voted are in the right, and that Sir Charles Turner and his majority are in the wrong, and that a wrong step has been taken in lowering the mental value of the Preliminary Scientific Examination for the L. M. S. or M. D. of the Madras University, by the omission of Latin as one of the tests. Sir Charles Turner is reported to have said that to prescribe Latin as one of the compulsory subjects in this Examination, would be only throwing obstacles in the way of candidates. Sir Charles referred, doubtless, to Native candidates. It is a remarkable fact that pure Natives of the country do not take to the study of the classical languages as European and Eurasian young men do, but such a circumstance, we maintain, can hardly justify the Syndicate in recommending, and the Senate in sanctioning, a measure which will only tend to lower the character and value of the Preliminary Scientific Examination, in the estimation of the true friends of the higher education.—*Bangalore Examiner.*

THE EDUCATIONAL DESPATCH OF 1854.

The Rev. J. Johnson has issued a second edition of his pamphlet on the subject of "Our Educational Policy in India." After a historical sketch of the educational movement in India from 1813 to the year 1854 when the despatch, appropriately regarded as the magna charta of Indian education was issued, the reverend author of this brochure gives a clear and correct view of the principles and aims of that famous State document. The first of its more important features is the extension of the sphere of education, or to put it in the words of the despatch, to enlarge the circle of study by introducing a greater number of useful subjects into the higher departments, and to extend the sphere of education so as to reach the lower classes of society. That this was the special aim of the Government in this despatch is more clearly brought out in the tenth paragraph. "We have also received *most satisfactory evidence of the high attainments in English literature and European science*, which have been acquired of late years by some of the natives of India." But this success has been confined to *but a small number of persons*; and we are *desirous of extending far more widely* the means of acquiring general European knowledge of a less high order, but of such a character as may be practically useful to the people of India in their different spheres of life." Two other paragraphs laid down the intentions of the Government as explicitly. They are too long for quotation here. And this extension of the circle of knowledge, it is distinctly laid down, was to be carried out by the supercession of Government Colleges by Colleges aided

by grants. Nothing can be more explicit than the declaration. "We have resolved to adopt in India the system of grants-in-aid which has been carried out in this country with very great success; and we confidently anticipate by thus drawing support from local resources, in addition to contributions from the State, a far more rapid progress of education than would follow a mere increase of expenditure by the Government; while it possesses the additional advantage of fostering a spirit of reliance upon local exertions and combinations for local purposes, which is of itself of no mean importance to the well-being of a nation." It was intended to encourage missionary colleges and schools as well as those supported by natives and resident Europeans, and the Home Government not only looked to the system of grants-in-aid as a means of saving the Indian Government from spending more on the extension of the higher education than they had been expending up to that time, but that it would lead to the lessening of that expense by the withdrawal of some of the colleges then in existence. The local governments and administrations were called upon to encourage the grant-in-aid system and it was ruled that "—Government colleges or schools should be founded for the future in any district where a sufficient number of institutions exist capable, with assistance from the State, of supplying the local demand for education. Indeed nothing can be more clear and unmistakable than the words of the despatch about the encouragement of private enterprise in the field of education by the extension of the grant-in-aid system. The framers of the despatch declared that they looked forward to a time when any general system of education, entirely sustained by Government, may be discontinued with the gradual advance of the system of grants-in-aid, and when many of the existing Government institutions, especially those of the higher orders, may be safely closed, or transferred to the management of local bodies under the control of and aided by the State. The Directors of the East India Company simply uttered a truism when they said that, the higher classes are both able and willing, in many cases to bear a considerable part, at least, of the cost of their education. The Universities were set up for the encouragement of private and aided colleges and it was the design that Government Colleges should eventually give way to them. The author of the brochure from which these facts are taken shows, by irrefragable proof, that the Home Government has never changed its policy since 1854. In the despatch of 1863 that Government said "it was one great object proposed in the despatch of the 19th July, 1854, to provide for the extension to the general population of those means of obtaining an education suitable to their station in life, which had hitherto been too exclusively confined to the higher classes; and it is abundantly clear from Lord Stanley's despatch of 7th April, 1859, that Her Majesty's Government entertained at that time the same sentiments which had been expressed by the home authorities in 1854. . . . But I think it necessary to declare that *Her Majesty's Government have no intention of sanctioning a departure from the principles already deliberately laid down.*" In 1861 Sir Charles Wood wrote; "Those principles are that, as far as possible, the resources of the State should be so applied as to assist those who cannot be expected to help themselves, and *that the richer classes of the people*

should gradually be induced to provide for their own education." The Duke of Argyll writing to the Viceroy said; "I should be understood as approving generally of the main principle which runs through your despatch, that the Government expenditure should, as far as possible, be reduced with reference to the education of those who are well able to pay for themselves, and should be mainly directed to the provision of an elementary education for the masses of the people." "If once we can instil into the real upper classes of India, that one of the main duties of society is to provide for the sound primary instruction of the humbler classes, we shall lay the real foundation for that general system of education which it is the desire of your Excellency's Government to establish." Sir George Campbell and other officials of great official authority similarly interpreted the meaning and intentions of the Despatch.

Yet the Indian executive in the Educational Department work to increase Government Schools and discourage local efforts in the teeth of the plain and often repeated declarations of the despatch. This point is clearly enforced by the writer of the brochure, and in moderate, yet telling words, he shows how a gross departure from the main principles of the Despatch has entailed injustice, discouragement to a mischievous degree local educational enterprise and has deprived the mass of the people of the kind of instruction suited to their actual condition and requirements. The brochure is a candid, lucid exposition of the despatch and the condemnation levelled against the Government of India is well deserved and comes with telling force. The following list of some of the advantages to be gained by faithfully carrying out the provisions of the Despatch of 1854, we take from it:—

1st. It would free the Government in India from a false position, in tacitly sanctioning the evasion, and in some cases the open violation by their own 'Directors of Public Instruction' of the rules laid down for the education of the people, and it would deliver our home Government from the sin and folly of allowing the spread of *discontent and disloyalty* in its name.

2nd. It would lead to the gradual withdrawal of large sums now needlessly lavished on the higher education of the rich, and their employment in the much needed elementary instruction of the poor.

3rd. It would encourage self-reliance and independence in the upper classes of society, and foster the spirit of beneficence amongst both natives and Europeans in the support of institutions for the higher education of themselves an important part of a nation's education.

4th. By substituting more largely the grant-in-aid, for *direct* Government instruction, they would greatly increase the means at their disposal for extending education in all its departments, without increasing the demands on the Government exchequer—at present not in a condition to be more largely drawn upon.

5th. It would free the higher Aided-Institutions from that unhealthy competition which now greatly hinders their influence for the moral and religious good of the youth of India, and it would vastly increase the sphere of their usefulness, without increasing the cost of their maintenance. In fact, the higher education might ere long become, largely self-supporting. Some of the higher schools have now reached that happy consummation.

6th. It would prepare the way for education being out on a better and safer platform.—*Standard.*

THE U. C. S. EXAMINATIONS.

Four examinations were held during the year 1879-80 in connection with the Uncovenanted Civil Service: the Special Test Examinations in August 1879; the General Test, including the modified General Test, and the examination of Matriculated Students in spelling and hand-writing in February 1880; the examination of candidates for the Subordinate Medical Department in September 1879, and the Middle School Examination in January 1880. The aggregate number of candidates registered for the several Special Tests was 4,512; of these, 4,104 were examined and 1,311 passed, against 1,131,961, and 1,044 in the years 1878, 1877, and 1876, respectively. The result in 1879, though slightly better than in the three preceding years, is still far from being satisfactory. The percentage of successful candidates compared with 1878 shows an increase in 1879 under "Judicial—Civil, higher;" "Translation Test, lower;" and "Precis Writing, higher and lower;" but a decrease under "Judicial—Criminal, higher and lower;" "Judicial—Civil, lower;" "Revenue Test, higher and lower;" and the "Pleader's" List for District Munsif Courts. No candidate passed the "Translation Test, higher," while the decrease under "Judicial—Criminal, higher," noticed in the review for last year still continues. The results are not satisfactory. The languages in which the candidates passed were—English 795, Telugu 193, Tamil 278, Malayalam 40, Canarese 38, and Uriya 2. No candidates passed in Hindustani or Tulu. The number of candidates declared eligible for the various subordinate offices in the Public Service was 1,628, against 1,262 in 1878. Fifty-five candidates appeared for the Police Test, of whom thirty-four passed. The result, compared with previous years, is highly satisfactory. Five thousand four hundred and forty-seven candidates registered their names for the General Test: 5,145 were examined, and only 1,050 passed. The Commissioner, it is observed, remarks that the result indicates "that the test is in some respects unsuited to the purpose for which it was originally intended." Of the number passed, 227 were in the 'Anglo-Vernacular Branch,' 499 in 'English,' and 309 in the 'Vernacular.' Fifty-five were Europeans and East Indians; 972 Hindus; and 32 Mahomedans. The Government Schools receive credit for 297; schools receiving grants-in-aid 473; other schools, 94; and private tuition 186. Fourteen candidates registered their names for the modified General Test; 11 were examined, 4 passed, and 1 failed in one subject only. Six hundred and four matriculated candidates applied to be examined in writing and spelling; 544 appeared for examination, of whom 322 passed. One hundred and fifty-seven candidates presented themselves for examination for the 'Civil Medical Pupil' grade. For the Middle School Examination instituted by Notification, dated 17th October 1879, 1,987 male and 10 female candidates registered their names. Of the former, 1,769 were examined, 196 passed in the first class and 954 in the second class. Of the latter, 9 were examined, 1 passed in the first class and 7 second class. The Commissioner remarks that owing to the late date at which the Notification was published there was not sufficient time for preparation, and that it was found necessary to make the question papers easier than they will be hereafter. One thousand seven hundred and thirty-five candidates registered their names to be examined in optional languages. Of which number 1,538 appeared for examination and 940 passed. The languages were Telugu, Tamil, Malayalam, Canarese, Hindustani, Persian, and Uriya. The receipts from fees aggregated Rs. 65,333, the charges Rs. 49,521, leaving Rs. 15,812 to credit, which is an improvement on the preceding years.

ON THE STUDY OF CHEMISTRY.

(A Lecture by Professor A. W. HOFMANN, LL.D.; F.R.S.)

In compliance with an invitation from the Committee of Council on Education, I will endeavour to bring under your notice some considerations on the Study of Chemistry as part in a well arranged system of mental cultivation. In an attempt of this kind, owing to the endless variety of relations which chemistry bears to other branches of knowledge, so many starting points present themselves, that it seems important to define at the very outset the aspects under which I propose to submit the subject to your attention. I may therefore state at once that I shall examine the question more especially in two directions, aiming, in this first lecture, at giving you a survey of the conditions which render the study of chemistry invaluable as advancing the material well-being and the intellectual progress of mankind, and pointing out in a second lecture, the path recognized by experience as the shortest and safest towards the perfect mastery of chemistry as a science; adding at the same time, some remarks on the chemical instruction in schools, where chemistry is taught as a branch of general education, and as a means of mental training.

The importance of the study of the natural sciences, and particularly of chemistry, becomes at once obvious when we compare our modern civilization with that of antiquity. Losing sight of the revolution brought about in the human mind by the reception of new religious views, as not immediately connected with the subject of this discourse, it cannot be denied that all the other steps of progress which modern times have made, are exclusively derived from the ardent cultivation of the study of nature.

In poetry and sculpture the ancients are still unsurpassed. What epic poem, as to originality, vigour, and freshness, can be compared to those of Homer? We admire the genius of a Shakespeare, the searching eye with which he traces human nature to her innermost recesses; we are carried away by his life-warm creations. Whether he reveal the tenderest emotions of the human breast, or roll before our view the stormy waves of passion, we unhesitatingly accord to him the palm as the first dramatic poet of modern times. Let those, however, who have read the Greek tragedians say, whether Sophocles has been surpassed by Shakespeare!—Modern sculpture ever turns to the antique as to a model of unattained perfection. In all times, from all countries, the sculptor has made his pilgrimage to Rome and Greece to study in the school of the ancients.

He who has seen the frescoes on the walls of Pompeii will bear witness to the high attainments of the painters of those ages, and,

granting a great development to the art of painting in modern times, it would be difficult to say how far this is owing to our different mode of viewing the world, which has altogether changed the scope of artistic aspiration, or to the technical improvements, more especially in the colours, which are at present at the disposal of the painter. It is next to impossible to form a clear notion of the music of the ancients; but, if we consider the simplicity of the instruments at their command, there can be no doubt that the advance, which modern music has made, is mainly referable to our perfected construction of their instruments and to the invention of new instruments, for which again we are indebted to an active study of the laws of nature.

Our writers of history, too, in what do they surpass their predecessors except in the endless abundance of material which century after century has heaped up in addition to what they possessed? The writings of the ancient historians are still the first which we place in the hands of our youth, and experience has proved what an inexhaustible source of mental and moral culture successive generations have found in these works. No nation of modern times has produced more brilliant orators than England; as none possesses freer institutions, the native soil of eloquence. But have modern orators outstripped the Greeks and Romans (except, perhaps, in the formidable length of their speeches)? To him who would ascertain what progress the schools of mental philosophy in latter times have made, compared with those of antiquity, I recommend a plunge into the works with which a certain school deluged the literature of Germany at the commencement of this century. Again, has not modern jurisprudence its very root in the Roman law? Is not the Roman law taught at this very day in all the continental universities? and is not the civil law of the Romans still in force in many states at the present time? I may be reminded of the enormous strides which the mathematical sciences have made in modern times, but we still learn from Euclid the rudiments of geometry: and we are quite sure that the methods, which, like so much new apparatus, has been supplied to mathematical operations, would have unfolded themselves, had it not been for the wonderful development of the natural sciences, more especially of physics which continually offered to mathematical treatment new material to be mastered, and thus in a measure involved the creation of these very methods?

I might easily pursue this parallel still farther, but I have already said enough for my purpose.* Modern civilization most undoubtedly has its footing in the zealous investigation which the present age has devoted to the forces of nature, and in the wonderful results to which this investigation has led, and, day by day, is leading. The study of the forces of nature has subjected them to our will. Knowledge is power; under no conditions is this axiom truer than when applied to the knowledge of natural phenomena. Time and trouble spent on the study of nature is amply repaid, for in every well examined physical force, man educates for himself an obedient servant, ready at all times to fulfil his behests.

* The subject has been very fully treated by Professor Pettenkofer in one of his popular lectures. In the same lecture the author lucidly explains the causes which, in antiquity, prevented the free development of the study of nature.

What giant strides in all directions have been made in consequence of the development of the various branches of physical knowledge? The power of steam has gradually become subservient to such a variety of uses that we can scarcely imagine our existence without it; and yet when we see our steamships cleaving the ocean from hemisphere to hemisphere, or the locomotive engine rushing with the speed of the storm over the country, how rarely does it occur to us that we are indebted for this rich inheritance to the patient study of the laws of *heat*? Were I to pursue, into its various directions, the influence which the substitution of steam power for the uncertain forces of water and wind, or for animal force, has exerted on the several arts and manufactures, I should exceed the limits of this sketch; but I am tempted to glance for a moment at the wonderful change which the introduction of steam has produced in the civilization of nations. We are still far distant from the reign of uninterrupted peace; the clang of arms no sooner ceases in one country, than the flashes of war are seen raging in another, but how different in form and fashion are our wars from those of antiquity! We still wage war, but no longer for the purpose of enslaving entire nations. We need no slaves, steam engines are our slaves, our helots. The constructions of our architects, and of our engineers, are not less grand than the pyramids of ancient Egypt, whilst they are immeasurably more useful; but no longer are the inhabitants of whole provinces made to groan for years like beasts of burden, no longer is the towering pile cemented by the sweat of an enslaved people.

A harvest of results, not less unexpected, has rewarded the inquiries in *electricity*, a science of which antiquity had not even an anticipation. A century has not passed since Franklin made his experiments with the electric kite; a shorter time still has elapsed since Galvani saw the frog's leg quiver on the balcony at Bologna, and scarcely have the inquiries been completed which place in its true light the connexion between the experiments of both observers; but what incalculable advantage has not the human race already reaped from these observations! Everyone knows that Franklin was led by the prosecution of his experiments to the invention of the lightning conductor, and that the elaboration of Galvani's observations gave rise to the construction, in the hands of Volta, of his battery, that grand lever of our own times. A faithful handmaid the voltaic battery multiplies for us, in durable metal, the noblest productions of artistic genius, formerly accessible only to the chosen few, and this with an accuracy of which no other mode is capable. Not satisfied with giving an exact copy of the form, it clothes the copper with a layer of silver or gold, almost imponderable, yet sufficiently close and uniform to protect the delicate surface against the tooth of time. Beaming from the lofty pharus, the electric ray warns the seaman from the treacherous rock, and guides him safely into port. As a winged messenger, lastly, annihilating time and space, the electric current bears our thoughts with the rapidity of their conception over land and under sea. Great as these acquisitions are, the list of benefits which our generation is destined to reap from the study of electricity is not yet concluded. It was by the help of the voltaic battery that Davy, at the commencement of this century, was enabled to decompose the alkalis into their

For if it is unjust to the pupil who makes a slip in the working to place him on the same level as the one who is utterly ignorant of the whole exercise; it is no less unjust to the teacher, for it gives to the result of his labours a much less than their true value. The manner in which a pupil works an example bears the impress of his teacher more distinctly than the figures of the result. Indeed, the accuracy of the working depends, not merely on the opportunities for practice, but very much too on the arithmetical bias of the pupil. We need not look for the same richness of perfume from every rose; for the same weight of crop from every kind of soil; or for the same accuracy of hitting from a Brown Bess as from a Whitworth rifle. Principal Forbes of St. Andrews, in once speaking of a student, said, "*I had reason to ascertain his great expertness and accuracy as an arithmetician.* Judging from my experience, I should say that *this is by no means so common a talent as it is often supposed to be.*" To speak phrenologically, if a boy has not a good organ of "number," there is little chance of a teacher's making him either as expert or accurate an arithmetician as one better endowed. And if, by the exertions of the teacher, the boy is *brought to appreciate* the manner of working, it will not produce a correct impression of the teacher's labours if, at a general examination of the arithmetical capabilities of the pupils, no value whatever is to be given for this work unless accompanied with perfect accuracy.

But lest it should be said that we *present too low a standard* by allowing for less accuracy, it is important to repeat that the object of the examination is simply to discover and allow for everything that the pupil can put forward on the subject. It does not follow, that because a knowledge of method is accompanied with inaccurate practice, the teacher should not, during the ordinary everyday work, insist on such additional practice and preparation as shall induce accuracy; but it does follow, that at a set examination of the kind proposed, some approximate value should be given for the true work he may have accomplished. As to the everyday work, the teacher, as the *generator of progress*, cannot set up too high a standard. Then the motto should be—"*I can't*" *never did anything.* "*I'll try*" has worked wonders. "*I will do it*" has performed prodigies. But at these set examinations, the teacher or the examiner, as the *registrar of results*, while he gladly notes all prodigies and wonders, should not ignore the result of the smallest trials. The proverb says, "*Bid for a silk gown, and you are sure of the sleeve.*" The teacher may keep the idea of the gown everyday before the mind of his pupils without refusing to measure the sleeve when they produce it.

In conclusion, if what we have said holds good in practical arithmetic, it *applies with double force* to theoretical arithmetic, in which the reason of the method is unfolded as the *basis of its practice*, and as we have already, by way of illustration only, alluded to *geometry*, the same might be applied and enlarged in the various departments of mathematics.—*The Museum.*

ON THE STUDY OF CHEMISTRY.

(*Concluded from page 270.*)

In giving you a brief outline of the influence which the study of chemistry, by the development of the manufactures of sulphuric acid and of coal-gas, has exerted on the progress of civilization of the present time, I have selected as illustrations two branches of industry, which are essentially of modern growth. Let us now glance at the benefits conferred by the development of chemistry on some of the arts, which formed the legitimate pride of antiquity.

Take *architecture* as an example. In Rome this art had reached the highest degree of perfection. The temples, the theatres, the aqueducts of the Roman architects, half ruined as they have been handed down to us, are justly admired as glorious monuments of their taste, of the vastness of their conception,—of their constructive powers. It is generally believed that the Romans have been the inventors of the ordinary mortars, some of their earlier buildings being constructed without the intervention of mortar. They certainly discovered the hydraulic mortars, which they subsequently used in all their marine buildings. The material originally used by the Romans in the preparation of hydraulic mortars, was the volcanic rock with abounds in the neighbourhood of Vesuvius, more especially near the town of Puteoli, the Puzzuoli of modern times. Ground to a fine powder and mixed with slacked lime, the dust of Puteoli, *pulvis Puteolanus* has the remarkable property of hardening under water. When the Romans penetrated into Germany, they found the same material in the valley of the Rhine and in the volcanic districts of the Eifel. For nearly 2,000 years the rocks of Puzzuoli and the trass-quarries of the Rhine were the only sources from which this valuable article could be derived. It was reserved to the science of our own age to unravel the mystery of hydraulic mortars. The attention of scientific inquirers was forcibly drawn towards this subject, when, at the close of the last century, Parker and Wyatt made the important discovery that the calcareous nodules, which are found in the clay of the London basin may be converted by simple burning into an excellent hydraulic mortar which had moreover the advantage of requiring no addition of lime. Patented in 1796, this discovery led to an important branch of industry,—to the manufacture of "Roman cement." The question of hydraulic mortars had entered upon a new phase by becoming the subject of scientific investigation. Geology and chemistry were appealed to, and it was not long before a satisfactory answer was obtained. Several observers have participated in this examination, but it was not until a prize, proposed by the Society of Harlem, elicited in 1828 the classical inquiry of Fuchs, and based the production of artificial hydraulic cements upon a scientific foundation. It would transgress the limits of this fugitive sketch were I to trace, step by step, the gradual development of the chemical theory of hydraulic cements; the question has been very ably discussed by Prof. Pettenkofer,* who in our own days has materially assisted in the final elucidation of this subject. Suffice it to say that the conditions involved in the solidification of water-mortars are now known, and that every

* Popular Lecture.

the faithful study of nature's phenomena, and in the investigation of her laws throughout creation. Modern chemistry has not attempted to convert lead into gold, but what immense sources of individual and national wealth have been opened since the adoption of its methods has infused new life into every branch of industry! On comparing the acquirements of the present age, our comforts, our sanitary regulations, our means of communication, &c., with the state of things in the last century, it may with truth be said that human life has actually gained in duration, while its enjoyments have been increased a thousand fold. It would be both interesting and useful, did this brief sketch admit of it, to notice the effects of chemical knowledge on the various branches of industry in every department of life. It would be found, that not only every art and every trade, but that every individual had profited by the labours of the chemist.

In taking a retrospect of the rapid progress which some of the arts and manufactures, depending upon chemistry, have made in modern times, we are at a loss to know where to begin our survey, every branch of industry could furnish the most brilliant illustrations.

Were I to trace with you the history of *sulphuric acid*, from the moment when the Erfurt monastery first witnessed oil of vitriol passing over, drop by drop, from the alembic of Basilius Valentinus, up to the present time, when hundreds of thousands of tons are sent forth from the colossal lead-chambers of Great Britain alone; were I to enlarge on the influence which chemistry, by raising the production of sulphuric acid to its present degree of perfection, has exerted on the development of chemical manufactures; were I to describe the action of sulphuric acid in the preparation of the other acids, of nitric, hydrochloric, of acetic acid; its application in the manufacture of phosphorus, its employment in the improved process of candle-making, in the isolation of stearine from crude tallow, its use by the dyer for preparing his colours, by the skin-dresser for opening the pores of the skin previous to the operation of tanning; by the metallurgist in the new process of refining silver; by the agriculturist in the preparation of most efficient manures,—I should have to unfold a picture for which it would be difficult to find the appropriate frame. Nor could I omit to show you Leblanc struggling with prejudice for the adoption of his great discovery: the transformation by the agency of sulphuric acid of sea salt into carbonate of soda; or to lead you into the busy factories of Lancashire, which now, after the lapse of less than half a century, provide not only this country, but half the world, with soda. Nor would the picture be complete without the glass-works and the soap manufactories in the distance, the operations of which have been forced into unprecedented activity by the production of soda, without the bleaching yards, which owe their very existence to Leblanc's great discovery!

It would be equally instructive to trace, in brief outlines, the history of *coal gas*, the manufacture of which has become, during the last thirty years, of truly national importance.

The evolution in different localities of inflammable gases from the ground has been noticed from time immemorial, and the connection of these gases with deposits of coal had been recognized as early as the middle of the seventeenth century.* Years, however, elapsed before correct views of the nature of these gases were established by experiment. In 1739, coal was for the first time subjected to distillation by Dr. Clayton, Dean of Kildare, who thus succeeded in imitating artificially the formation of native gas. From this moment the subject was never lost sight of, but it was not till the end of the last century that the intellectual impulse of that memorable period overcame the difficulties opposed to the practical application of this new source of light. These obstacles we know have been at last entirely removed; gas light is now universal. Our streets, our public buildings, our private dwellings, are brilliant with its radiance. In our daily enjoyments of its benefits, we have almost ceased to be conscious of the comfort and even personal security, which we owe to this, as yet, the best, cheapest, and safest of lights.

But, to the attainment of this end, how many were the scientific problems to be solved, how often had the gas-maker to seek the assistance of the scientific chemist, and to avail himself of the results of his researches, instituted originally perhaps for very different purposes! What a difference between the gas with which Mr. Murdoch lighted up the Soho foundry in Birmingham, and that now circulating in the arteries of our nightless towns!

The gas produced by the distillation of coal is not an uniform substance. Together with the principal illuminating constituents, light carbonetted hydrogen and olefiant gas, many other gases are evolved during the distillation, some of which, *e.g.* hydrogen, tend rather to diminish the illuminating qualities of the gas, whilst others, as ammonia and sulphuretted hydrogen are injurious to health. This formed a serious obstacle to the adoption of coal-gas as a domestic light. By the aid of chemistry, the composition of coal-gas was ascertained, and the nature of its constituents, useful and deleterious, determined. Founded on the knowledge thus obtained means were devised for the separation of the latter: the temperature was indicated, at which the purest gas comes over during the process of distillation, whilst for the improvement of gas less rich in illuminating constituents, the beautiful and economical process of naphthalization was suggested. And, finally, simple and elegant burners were contrived for the safe and economical combustion of the product.

The extent to which the use of gas has affected the arts and manufactures in this country, can only be conceived by those who are aware of its innumerable applications in the double capacity of giving heat and light. The benefits afforded by gas to our experimental chemists cannot be overrated, more especially in England, where the price of spirits of wine was at one time so exorbitant. But for the use of gas in the laboratory, the progress of chemistry in this country must have been greatly retarded.

In speaking of the general influence of the manufacture of coal gas, it is impossible to leave unnoticed the number of hands daily engaged in raising whole strata of coal, and in loading and navigating the fleets employed in conveying it, not only to the different ports of this kingdom but to foreign countries, which consume a

* Mr. Shirley's experiments on the burning well of Wigan, in the Transactions of the Royal Society for 1659.

much larger quantity of English coal for the production of gas than is generally known. The extension of the gas enterprise produced a sensible effect on the iron works by the vast number of retorts, the stupendous gas-holders, and the endless pipes, required for generating, storing, and conveying the gas. Several other branches of trade were also forced into increased activity; and even new trades sprang up in consequence of the extended use of gas. The substances produced in the purification of gas naturally attracted the attention of the gas manufacturer; and chemistry soon pointed out valuable purposes to which they might be applied. The oily matter, which is separated as a secondary product in the distillation of coal, has been the subject of various chemical researches, amongst which must be singled out the elaborate* investigation of Charles Mansfield, a young chemist of extraordinary promise, whom a cruel fate tore away too early from science and his friends. His researches showed the more volatile portions of this oil to consist chiefly of benzol, an interesting compound discovered some years previously by Faraday. The history of benzol alone and its uses, would fill a little volume. Capable of undergoing in the hands of the chemist and endless number of proteus-like transformations, this substance has not only assisted the progress of science itself, but given rise to new and important branches of industry. Let me remind you that benzol is the most convenient solvent for caoutchouc, that, as an agent for removing oil and grease, is has become an ordinary household article, that in perfumery and in confectionery we use it as a substitute for the essential oil of bitter almonds; let me remind you, lastly, that, converted by a succession of chemical processes into aniline, it has given rise to the production of those beautiful mauves, purples, and crimsons in which the lovelier portion of mankind is now indulging to the exclusion of almost every other colour. Nor have the other products of the distillation of coal, which accompany the benzol, proved less useful; the liquid distilling at a very high temperature was found to be an efficient preservative of timber, and the pitchy residue formed the chief ingredient of an excellent substitute for the flag-stones of our pavement, while the ammoniacal liquors were found useful in improving the fertility of land. Thus, after the lapse of countless ages, will the nitrogen of petrified fern forests resuscitated in the ammoniacal liquors of the gas works, to vegetate once more, and increase the produce of our corn fields.

(To be continued.)

* Charles Blachford Mansfield died (Feb. 1855), a victim of his scientific zeal, in consequence of an accident which he caused to him whilst he was engaged in experimenting with benzol. The memory of this young man, in whom intellectual powers of the highest order were wonderfully blended with the rarest gifts of the heart, will be cherished by all those who had the good fortune of meeting him during his short but useful career.—A. W. H.

CENTRAL COLLEGE, BANGALORE.

Fourth College Class.

THE THEORY OF MORALS.

I. What are the ultimate motives of all human actions good or bad according to Bain? In what sense is it true to say that happiness is the sole end of human pursuit?

II. Criticize the following propositions:—
(1) Virtue and happiness coincide in the long run.
(2) The utilitarian standard is too high for ordinary men.
(3) It is the privilege of vice to be without restraints.

III. Show clearly how the emotions as a class form an element of conscience.

IV. How does Bain show the origin and growth of the idea of the supremacy, authority, or rightness of conscience.

V. Refute Hobbes' theory of benevolence.

VI. Bain characterizes part of Butler's teaching as an attempt to escape from the admission that the sole determinants of the will are pleasure and pain. Explain and examine this.

VII. Can resentment be resolved into a reasonable concern for our safety?

VIII. Define conscience according to Butler and show whether apart from conscience there is any higher difference between the principles of human nature than a difference of strength.

IX. (1) Hobbes defines compassion as imagination or fiction of future calamity to ourselves, proceeding from the sense of another man's calamity. Criticize this definition.
(2) Give Butler's arguments to show that self-love, and benevolence are not opposed.

X. (1) Wealth leads many men into vices, therefore wealth cannot be a source of happiness. Criticize this idea.
(2) Give the special bearings of activity and occupation on happiness.

Fourth College Class.

INDUCTION.

I. (1) What is the Inductive syllogism of Aristotle?
(2) Give an instance of a discovery of identification to establish a minor falsely called induction. How does it resemble induction? 6

II. (1) Show that the sole evidence of all inductions whether of co-existence or causation is universal agreement. (2) What then makes the difference between inductions of co-existence and inductions of causation? (3) Is the law of causation an induction? (4) What is the ultimate assumption at the root of all inductions properly so called, which justifies what is called the inductive leap? Is there any proof of that assumption? 16

III. Is the proposition that all gold possesses eight different properties which can be enumerated, an induction of co-existence? If not, what is it? What claims has it to be called an induction? 10

IV. Derive the modes of ratiocination from the law of causation. Why are they called deductive methods? What is the sole inductive method? 10

V. (1) Give the criteria of an Empirical Law.
(2) When does an empirical law become as certain as a law of nature. 8

VI. "Is there" says Hume "any principle in all nature more mysterious than the union of soul and body" show how the scientific explanation of the union of body and mind is to be aimed at? 8

VII. What are inductive analogy, and analogy different from induction. Give examples. 8

VIII. (1) What are the relations between Classification, Abstraction and Definition.
(2) What are the true methods of Definition and how are they derived.
(3) Criticize the scholastic method of defining by genus and differentia. 12

IX. (1) If a body moves it must be either in the place where it is or in the place where it is not. But a body cannot move in the place where it is, nor yet in the place where it is not hence a body cannot move at all. What is the fallacy and how is it caused?
(2) Every mode of stating the doctrine of innate ideas commits or borders upon a fallacy provided we accept the theory of Nominalism. State the fallacy and show that this statement is true. 12

X. Explain :—Bacon's Prerogative Instances Enthymeme Porphyry's Tree. 10

Fourth College Class.

BAIN'S PSYCHOLOGY.

I. Give an exhaustive classification of sensations. How are the emotions related to sensations; state how they arise? 8

II. What part does the spontaneous activity of the system play in Bain's philosophy? 10

III. Show clearly how the notion of space is more complex than the notion of time. Give concisely the stages by which we arrive at a complete notion of space. 10

IV. (1) Mention circumstances that affect the detection of similarities amidst diversity, showing their application to Newton's discovery of universal gravitation. 10
(2) Show briefly how all reasoning and science depends on the intellectual force of similarity. 10

V. (1) Explain how we judge distance.
(2) How do you answer the objection that in perceiving distance we are not conscious of tactual feelings or locomotive reminiscences; what we see is a visible quality and nothing more. 9

VI. (1) Bain calls the object world a part of our knowledge. Show how this is true.
(2) What position does our body occupy in our knowledge?
(3) What causes the distinction between the object world and the subject world? 9

VII. (1) How does Hamilton divide philosophers with regard to their theories of the perception of a material world?
(2) Give as concisely as you can the Psychological Theory of the belief in an external world. 12

VIII. (1) What effect has the recollection of pains on the formation of our characters?
(2) Give Bain's analysis of the emotions of sympathy and belief.

IX. Explain the links between feeling and action and state all the elements in the growth of voluntary power. 8

X. (1) Give the meanings of consciousness. What are Locke's Reflection and Hamilton's Presentation.
(2) Give Sir W. Hamilton's general and special laws of succession and show where they are included in Bain's Philosophy. 12

MAHARAJA'S HIGH SCHOOL, MYSORE.

Senior F.A. Class.

ARITHMETIC.

Time—3 hours.

Examiner.—R. Ragonath Rao, B.A.

I. If any large number were to be given, how are we to judge, without actual division, whether or not it is divisible by 9? Take an example and illustrate the rule.

II. A merchant has 3757 measures of Ragi, 1573 measures of Rice, 1053 measures of Black Gram, 637 measures of Bengal Gram, and 832 measures of Green Gram. Without mixing them he wants to preserve them in bags of equal capacity, holding the greatest possible number of measures. How many measures should each bag contain? and supposing that each bag costs 1¼ as., what sum of money has he to spend for them?

III. The length and breadth of a room are in the ratio of 10 : 9; if the room be 3ft. longer, the length and breadth will be as 7 : 6. Find the dimensions of the room.

IV. (a) What is meant by compound Interest?
(b) On what sum of money, will the compound interest for two years be the same as the simple interest on £9,500 for 10 years at the rate of 5 per cent. per annum?

V. A contractor undertakes the construction of an embankment in the Mysore State Railway 1 furlong long, 6 ft. wide at the top, 8 ft. high with a slope of 4 to 5. How many men must he employ to construct it in 55 days, if 30 coolies can raise an embankment 20 ft. long, 6 ft. high, and 9 ft. broad in a day? He pays his coolies 8 annas per day, and an anna for every cubic yard of earth; the Government pays him 8 annas for every cubic yard; does he gain or lose, and how much?

VI. Two persons A and B, of whom A travels 5 miles an hour leave Mangalore at the same time, and travel towards Tellicherry by the same road. A who is the faster walker reaches Tellicherry first and returning immediately meets B at a place 25 miles from it. If after reaching Tellicherry A had changed his speed, and walked back at the same rate as B, he would have met him 5 miles nearer Tellicherry. Find the rate of B, and the distance between Mangalore and Tellicherry.

VII. (*a*) A owes B £1,000, in liquidation of which debt he gives him a bill of £600 due 10 years hence, another bill due 4 years hence, and £266-13-4 in cash. What is the value of the latter bill, interest being at the rate of 5 per cent. per annum, and allowing true discount?

(*b*) Define what discount is.

VIII. A and B join together, and set up as traders in salt; A puts in Rs. 500, and B puts in Rs. 450; at the end of four months A withdraws ⅓ his capital, and at the end of 6 months B withdraws ⅔ of his. C then enters with a capital of Rs. 700. It is agreed that A is to conduct the whole business for which he is to receive 5 per cent. of the profits. At the end of 12 months, the total amount of profits is Rs. 2,540. How much does each get?

IX. A cubical box contains 941,192,000 solid inches; find the cost of painting its outside surface at 6d. per square foot.

X. A person has £95,000 stock in the 4 per cent. South Sea annuities. The Government offers him the choice of being paid off at par at the end of the year, or of receiving £110 of a new 3½ per cent. stock for each £100. He chooses the former alternative; and on being paid off, is able to invest his money in the 4 per cent. consols at 92. Find the amount of his stock in consols, and the excess of his income above what it would have been if he had agreed to the proposed conversion.

Matriculation Class.

PHYSICS.

Time—3 hours.

Examiner.—C. Waters, M.A.

I. Explain the terms 'Inertia' and 'Force.'
Mention the forces acting on a cricket ball thrown by a person, 1st, along the ground, and 2ndly, through the air.

II. Define specific gravity. How is it ascertained for a given substance?

(*a*). A piece of cast brass, whose specific gravity is 8, weighs 34½ ounces in a fluid and 40 ounces out of it, of what specific gravity is the fluid?

(*b*). Why does a hollow pot float with its lower part on water? If it is broken to pieces why do not the pieces float?

III. Explain the principle of the barometer. Why does the barometric column fall in ascending from the surface of the earth?

Given that the same bulk of air and water are as 1222 : 1000, and that the height of the water barometer is 33¾ ft., find the height of the atmosphere, supposing it to be of uniform density.

IV. What is the physical cause of the water flowing through the lower orifice of the Siphon? By what simple artifice can you make the water flow, if the Siphon is not filled with water before inverting?

V. Explain what happens to the level of water and the air in the following cases:—(1) When a tumbler is inverted into a jar half filled with water, (2) When the inverted tumbler is first heated and then suddenly immersed in the jar.

VI. If a tube AB closed at A and open at B, be inverted and pushed down into water, find when it will be half filled.

VII. In conducting water for the supply of a town from a high reservoir by means of pipes, the strength of the parts below the level of the reservoir must be proportionate to the difference of level. Why so?

VIII. If a body be immersed in a fluid of the same specific gravity four feet below the surface, what position will it assume on removing the hand?

IX. 'Cold increases the density of water.' Is this statement wholly true? Why is the specific gravity of ice less than that of water?

X. Explain what is meant by Latent Heat and Conduction of Heat.

(*a*) Is the latent heat of bodies permanently absorbed by them? explain fully.

(*b*) What is the advantage of a previous fall of snow during a severe frost?

(*c*) Why does a glass tumbler in which hot water is suddenly poured, often break?

Matriculation Class.

(I) GENERAL GEOGRAPHY.

Time—3 hours.

Examiner—G. DUNNING.

I. Draw an outline map of the world showing the directions of *the principal* mountain chains, and naming the highest peak in each.

II. If the export trades of Brazil and Australia were stopped, how would England, Russia, and India be respectively affected?

III. (*a*) Name the chief Indian exports, and the principal places where they are produced.

(*b*) With what countries does India mostly trade?

IV. Name (*a*) three important seaport towns in Brazil: (*b*) three of the chief towns of China; (*c*) the lowest volcano in the world; (*d*) the tributaries of the Danube; (*e*) the densest and the most extensive forest in Europe, and (*f*) the place where the greatest amount of rain falls.

V. Name and briefly describe the forms of government prevailing in the following countries:—France; Japan; Ecuador; Burmah; Brazil; and Siam.

VI. Supply the words omitted in the following:—

"A far greater quantity of the precious metals is obtained in ——— than any other European country. Gold is found chiefly in N. W. ——— and———. Quicksilver is obtained at ——— in ———, where is next to that of ——— in Spain, the richest mine in Europe."

VII. What and where are the following:—Archangel; Lucerne; Seville; Astrakan; Ballarat; Miyako; Nelson; Pittsburgh; Quito; and Maladetta.

(II) Physical Geography.

VIII. (*a*) Account for the phenomenon of "uninterrupted day and night" to which certain portions of the earth's surface are, at different periods of the year, subjected.

(*b*) What would happen if the axis of the earth coincided with a prolonged radius of the sun?

(*c*) What follows from the fact, that a man's horizon, *at all places on the surface of the earth*, is a circle?

IX. (*a*) What are "oceanic currents" and how are they caused? Give one notable example.

(*b*) How is the existence of under currents in the ocean demonstrated?

X. Write a history of the column of air that rises from the equatorial regions.

XI. Supply the words omitted in the following:—

"The Cavery is fed, directly or indirectly, by ——— and this is condensed from ———, which has been raised into the ——— by means of ———. Without the —— therefore, there could neither be —— nor rivers, and hence it is not too much to say that the origin of the Cavery is ultimately to be traced to the——— is dependent for its distribution upon ——— in the atmosphere but these ——— are due to disturbances of ——— which are brought about by means of ———."

THE REFORMATORY SCHOOL SYSTEM.

A correspondent of the *Standard* writes:—"In a late issue of the *Madras Times* and in one or two of your recent impressions, allusion was made to the want of a reformatory in Madras, and the Alipore and Sassoon Reformatories were pointed out as examples of what may be effected, if the reformatory system were introduced in this city. It is hardly necessary to recapitulate what Mr. Justice Kernan and other judges have said in respect to this great want. All that they have said and recorded has fallen flat upon the Government who have money enough to spend in the building of palatial residences for Governors at Ooty, but who invariably set their faces against what is really needed for the country. In connection with the establishment of a Reformatory in Madras, attention may be called to the promise made by the Hon'ble Mr. Hudleston, who in seconding the introduction of the Police Contribution Bill in the Madras Legislative Council, said that one of the measures to be taken in hand as soon as the Bill was passed into law and contributions made by Municipalities to Provincial funds (which would thereby be greatly relieved of the cost of the police), would be the establishment of a Reformatory School in Madras. Mr. Hudleston said at the time that the plans and estimates were ready, that the work would be taken in hand as soon as funds were available, that a suitable site had been selected for the Reformatory at the Sydapet farm, so that the inmates of the Reformatory may be able to learn agricultural work which is most suited to them. The Police Contribution Act has been in existence for about two years, the Government have squeezed money from Municipal funds for the up-keep of the police; the Madras Municipality feels the drain upon its resources in consequence of this extra demand, but have the Government fulfilled the pledge made at the meeting of the council by Mr. Hudleston? There is enough money to spend upon useless undertakings and palatial residences. It is reported currently that the Rurapa rebellion has already cost twenty-five lakhs, and that seven lakhs have been expended upon Government House, Ootacamund, but a few thousands cannot be spared to start an institution which is a real necessity and the construction of which the Government of India have sanctioned. Is the Madras Government redeeming its pledges by acting as it does? When Mr. Hudleston "ope's his mouth" in council he speaks with the authority of a Sir Oracle. It would be wi wever, not to pin faith in men who generally keep the word of promise to the ear and break it to the hope."

PRINCIPLES OF RATIO, PROPORTION AND VARIATION, TREATED ARITHMETICALLY.

[More than one attempt has recently been made to substitute the Unitary Method of working examples in Rule-of-Three for the old method of Proportion. My own view is, that the Unitary Method only should be used during the early years of arithmetical study; but that the more advanced student of arithmetic should understand and apply the principles of Ratio, Proportion, and Variation. I offer the following pages in the hope that they may be useful to some of your readers who believe in principles more than in rules. It is intended that the study of these pages should follow that of vulgar and decimal fractions, and precede that of geometry and algebra. They should, in small portions at a time, be thoroughly explained, abundantly illustrated, and then dictated to the class; afterwards they should be continually referred to in working examples, in fact, the working of *every* example in proportion should be logically based upon these principles.]

Section I.—Ratio.

1. Def. 1. *Ratio* is the relation which two quantities of the same kind bear to one another, with respect to magnitude, the comparison being made by considering what multiple, part, or parts, the first quantity is of the second.

A ratio is expressed thus, 3 : 5, which is read 3 to 5.

The two quantities are called the *terms* of the ratio; the first is called the *antecedent*, the second the *consequent*.

2. Instead of the concrete quantities, which usually form the terms of a ratio, the abstract numbers that measure them are often substituted, the unit of measurement being of course the same for both quantities. Thus, for the ratio 3lbs. : 5lbs., we often substitute the ratio 3 : 5. The change from the quantities themselves to the mere numbers that measure them, should be always carefully noted.

3. Since the multiple, part, or parts that one quantity is of another can always be expressed by the fraction that the first is of the second, a ratio is *measured* by the fraction which has the antecedent of the ratio for its numerator and the consequent of the ratio for its denominator.

4. Two ratios are equal when the fractions that measure them are equal.

5. A *theorem* is the formal statement of a mathematical truth.

6. Theorem I. *If the terms of a ratio are multiplied or divided by the same number, the ratio is unaltered.*

Take any ratio 12 : 20, and let its terms be multiplied by any number 3; then shall the ratio 36 : 60 be equal to the ratio 12 : 20.

For the ratio 36 : 60 is measured by the fraction $\frac{36}{60}$, § 3.

and the ratio 12 : 20 is measured by the fraction $\frac{12}{20}$, § 3.

but $\frac{36}{60} = \frac{12}{20}$, by vulgar fractions;

∴ the ratio 36 : 60 is equal to the ratio 12 : 20. § 4.

It can be proved in a similar manner that a ratio is unaltered if its terms are divided by the same number.

7. The generality of the reasoning in Theorem I., and all other Theorems, should be carefully noted; the argument would be precisely the same if any other ratio were taken instead of 12 : 20, or any other number instead of 3.

8. A Theorem, consists of two parts, the *hypothesis* or part given, the *conclusion* or part to be proved.

In Theorem I., the hypothesis is that the terms of the ratio are multiplied or divided by the same number, the conclusion is that the ratio is unaltered.

9. The bearing of Theorem I., will be seen more clearly if we examine the effect of *adding* or *subtracting* the same quantity to or from the terms of a ratio. It will be found that by this operation the ratio is always altered, except in the case in which its terms are equal.

10. Def. 2. If there are two or more ratios, the ratios formed by multiplying together all the antecedents for a new antecedent, and all the consequents for a new consequent, is called the ratio *compounded* of the original ratios.

11. Theorem II. *If there are two sets of ratios, and the ratios of the first set are respectively equal to those of the second set, then the ratio compounded of the first set is equal to the ratio compounded of the second set.*

Take the two sets of ratios 3 : 5, 7 : 11; and 6 : 10, 21 : 33; the ratios of the first set being respectively equal to those of the second; then shall the ratio 3×7 : 5×11 be equal to the ratio 6×21 : 10×33.

For 3 : 5 = 6 : 10 by hypothesis.

and 7 : 11 = 21 : 33 "

∴ $\frac{3}{5} = \frac{6}{10}$ and $\frac{7}{11} = \frac{21}{33}$, § 4.

∴ $\frac{3}{5} \times \frac{7}{11} = \frac{6}{10} \times \frac{21}{33}$, since if equals are multiplied by equals the products are equal,

∴ $\frac{3 \times 7}{5 \times 11} = \frac{6 \times 21}{10 \times 33}$, by vulgar fractions,

∴ 3 × 7 : 5 × 11 = 6 × 21 : 10 × 33 § 4.

12. A remark may be made on Theorem II., similar to that on Theorem I. in § 9. It will be found on trial that the ratios which result from the *addition* of the antecedents and consequents of equal ratios are *not necessarily* equal. Thus, although 1 : 2 = 5 : 10, and 3 : 2=6 : 4, yet it is not true that 1 + 3 : 2+2=5+6 : 10+4.

Section II.—Proportion.

13. Def. 3. Four quantities are said to be *in proportion*, or *proportional*, when the first is the same multiple, part, or parts of the second as the third is of the fourth.

14. Thus, since 3 is three-fourths of 4, and 6 is also three-fourths of 8, the numbers 3, 4, 6, 8, are in proportion.

Proportion is usually denoted thus—

3 : 4 :: 6 : 8

which is read 3 is to 4 as 6 is to 8.

15. On comparing Def. 3 with Def. 1, it will be seen that when four quantities are in proportion, the ratio of the first to the second is equal to the ratio of the third to the fourth.

Hence we may denote a proportion thus—

$$3 : 4 = 6 : 8$$

which is read—the ratio 3 to 4 is equal to the ratio 6 to 8.

16. The first and fourth terms of a proportion are called *extremes*, the second and third are called *means*.

17. Theorem III. *If four numbers are in proportion, the product of the extremes is equal to the product of the means.*

Take any proportion—

$$6 : 10 :: 3 : 5$$

then shall $6 \times 5 = 10 \times 3$.

Because $6 : 10 :: 3 : 5$ hypothesis.

$$\therefore \frac{6}{10} = \frac{3}{5}$$ Def. 3.

$$\therefore \frac{6 \times 5}{10 \times 5} = \frac{3 \times 10}{5 \times 10}$$ by vulgar fractions,

$\therefore 6 \times 5 = 3 \times 10$ since the denominators of the last fractions are equal.

18. If the four terms of the proportion are concrete quantities, the abstract numbers that measure them must be substituted for the quantities themselves, before Theorem III. can be applied.

19. Theorem IV. *If the product of one pair of numbers is equal to the product of another pair, then the four numbers are in proportion, provided they are so taken that the numbers of one pair form the extremes and the numbers of the other pair the means.*

Take any pair of equal products 6×5 and 3×10, then shall 6 be to 10 as 3 to 5.

Because $6 \times 5 = 3 \times 10$ hypothesis.

$$\therefore \frac{6 \times 5}{10 \times 5} = \frac{3 \times 10}{5 \times 10}$$

since, if equals are divided by equals, the quotients are equal,

$$\therefore \frac{6}{10} = \frac{3}{5}$$ by vulgar fractions,

$\therefore 6 : 10 :: 3 : 5$ Def. 3

20. Two Theorems are said to be *converse* to one another when the hypothesis of each is the conclusion of the other.

21. It will be seen that Theorems III. and IV. are converse to one another. It must not be supposed that because a theorem is true its converse is therefore necessarily true; thus it is true that—

"If a thing is gold, it glitters;"

but it is not necessarily true that—

"If a thing glitters, it is gold."

22. It follows, from Theorem IV, that a proportion will still hold good after any operation has been performed on its terms, which does not destroy the equality of the product of the extremes with the product of the means. Hence an extreme and a mean may be divided or multiplied by the same number.

23. The operation of *dividing* an extreme and a mean by the same number, is called *cancelling*.

It should be carefully observed, that we may cancel together—

the first and the second terms,
the first and the third,
the second and the fourth,
or the third and the fourth;

but that we may not cancel together—

the first and the fourth,
or the second and the third.

24. Theorem III. enables us to find any term of a proportion, when the other three terms are given.

Ex. To find the second term in the proportion—

$$4 : ? :: 9 : 6$$

By Theorem III., the second term multiplied by $9 = 4 \times 6 = 24$,

$$\therefore \text{the second term} = \frac{24}{9} = \frac{8}{3} = 2\frac{2}{3}.$$

Section III.—Variation.

25. Def. 4. When two quantities are so connected that any two values of one are to one another in the same ratio as the two corresponding values of the other, one of the quantities is said to *vary directly as* the other, or shortly to *vary as* the other.

26. A convenient *test* of direct variation, is to try whether *doubling* one quantity has the effect of *doubling* the other, *trebling* one the effect of *trebling* the other, and so on.

27. The following are examples of quantities varying directly as one another:—

Rent of land...	varies as	Area of the land.
Cost of carriage	„	Weight carried.
Quantity of oats consumed...	„	No. of horses that consume.
Simple Interest	„	Principal.
Simple Interest	„	Rate per cent.
Simple Interest	„	The time.

28. The following are examples of quantities one of which increases when the other increases, but which do *not* vary as one another:—

Distance a stone falls from rest	does *not* vary as	The time of falling.
Amount at Simple Interest...	„	Rate per cent.
Amount at Simple Interest...	„	The time.
Compound Interest	„	The time.

29. If the antecedent and consequent of a ratio are interchanged, the new ratio so formed is called the inverse ratio of the original ratio. Thus $5 : 3$ is the inverse ratio of $3 : 5$.

30. Def. 5. When two quantities are so connected that any two values of one are to one another in the *inverse* ratio of the corresponding values of the other, one of the two quantities is said to *vary inversely as* the other.

31. A convenient *test* of inverse variation is to try whether *doubling* one quantity has the effect of *halving* the other, *trebling* one the effect of *dividing* the other by three, and so on.

32. The following are examples of quantities varying inversely as one another:—

No. of men required to do a work	varies inversely as	No. of days allowed.
Length of carpet required to cover a floor ...	" "	Breadth of carpet.
No. of yards of cloth that can be bought for a given sum	" "	Price per yard.
Weight of goods carried for a given sum ...	" "	Distance.
Time required to travel a given distance ...	" "	Rate of travelling.

33. The following are examples of quantities one of which diminishes when the other increases, but which do *not* vary inversely as one another—

Amount of heat obtained from a fire	does *not* vary inversely as	Distance from the fire.
Principal that will produce a given amount..	"	The time.

34. Arithmetical examples can be solved by proportion when the quantities involved vary directly or inversely as one another, and not in any other case.

35. If one quantity changes with two (or more) other quantities, it is immaterial whether we suppose the changes in those quantities to take place *simultaneously* or *successively*.

This principle is used in "Compound Proportion." It is almost self-evident, as may be seen by considering the following example:—

The *area* of a field depends on the *length* and the *breadth* of the field; if the length and the breadth be each doubled, the *area* will be increased fourfold, and this will be the case whether we suppose the length and breadth to be changed simultaneously, or whether we suppose the length to be first changed and then the breadth to be changed.—*From the English Journal of Education.*

R. LEVETT, M.A.

UNIVERSITY MEN IN THE PUBLIC SERVICE.

THE new rules about the admission of University men into the Public Service, which have been published in a Government Resolution in the last *Bombay Government Gazette*, must have taken the public by agreeable surprise. Many were under the impression that the Committee, which Sir Richard Temple appointed in September 1878 to suggest to Government some measures whereby the admission of graduates into the Public Service would be facilitated, had concluded its labors long ago and the Resolution of Government issued at the beginning of last year to the effect that graduates should commence with the second clerkships in a Mamladar's office on Rs. 35 per mensem, was merely the fruit of those labours. It appears now, however, that the Committee had yet to come to some decision when the Resolution of January 1879 was framed. The present Resolution of the Government is more thorough and practical in the conclusions which it embodies. The Committee, to whose efforts the public owes the Resolution, consisted of two well-known civilians—Messrs. Pedder and Moore—and of two educational officers—Professors Kirkham and Forrest. The suggestions made by this Committee, of which, the *Bombay Gazette* tells us, Prof. Kirkham was the most active spirit, have been literally approved by Government. They are as follows:—

(1.) Candidates who have passed the Matriculation shall have a preferential claim to vacant appointments over candidates who have merely passed the Public Service Examination (First Class), unless these last hold the 2nd year Certificate for the Agricultural High School Class.

(2.) Candidates who have passed the F. A. Examination shall have a preferential claim for situation of Rs. 30 and upwards over candidates either in or out of the service who have merely matriculated.

(3.) At least one-half of all vacancies in Departments other than the Revenue Department, of the value of Rs. 50 per mensem and upwards, shall be given to graduates, especially to graduates of distinction.

It need hardly be pointed out that this settles the controversy in a satisfactory manner. The question of the appointments of graduates in the Revenue Service had been mixed up with issues of a conflicting nature ever since Sir Bartle Frere ruled that competent graduates should be appointed to Mamluts all at once. The rule was tried in two or three cases in all of which it succeeded well. But the narrow-mindedness of a few officials evidently disliked an experiment, which deprived them of the free exercise of their powers of patronage and thrust upon them educated men, against whom they entertained certain prejudices somehow or other. The main ground urged by these officials was that it was unwise to appoint raw men to such responsible posts as Mamluts, which required experience and a thorough acquaintance with the routine of revenue business. To a certain extent, we must admit, the objection so raised had some force in it; but reasonable or not, the fact that it was raised by many Collectors and that it was supported by Mr. Chatfield, the Director of Public Instruction, was itself sufficient to make it a serious objection. The Committee had there-

fore to take proper notice of it. But there was at the same time another difficulty to be met. The three instances, in which Sir Bartle's experiment was tried, had succeeded well enough and no man, who knew anything of the course of training undergone by a graduate, could reasonably hold that he should begin at the lower end of the Service as much as an uneducated man. If it was exceeding the bounds of reasonable liberality to rule that a graduate should be appointed a Mamledar all at once, it was going to the extreme of illiberality to hold that he should commence with Rs. 35 a month. The Committee seem to us to have weighed both these sides of the question apart from any prejudices and their recommendation that appointments of Rs. 50 and more should be given to graduates has this to be said for it—that it reconciles both the sides in a fair spirit.

This is not all that the Committee we speak of has done. In its carefully prepared Report it drew the attention of the Government to the fact that higher education was falling because no inducements were held to graduates to enter the Public Service. That Government should encourage each and every graduate to enter its service is no doubt hardly reasonable; nor would such encouragement be productive of good to the graduates themselves. But the Committee pointed out that reasonable inducements should be held out to the men concerned, because in this country as in England, education is sought for not for its own sake, but because of the means of livelihood it furnishes to its recipient. In England, graduates look to the ecclesiastical and educational service for support; in India, the ecclesiastical service, so far as Native graduates are concerned, does not exist whereas in the educational service they can hope to be Head Masters of High Schools the higher appointments being held by Europeans. It can hardly be contended, therefore, with any show of reason that the graduates should have no scope granted them in the Revenue Service. There is another mischievous delusion, which the Committee has tried to clear away. It is this—that in India higher education is bestowed on our young men at a gratuitous cost. Men, who indulged in this misleading statement, never cared to go into facts and figures, and indulged in it because it served a purpose. Prof. Wordsworth recently pointed out that the statement was simply false; but long before the Professor contradicted it, the Committee had already, it appears, drawn the attention of Government to the absurdly false statement. They urged the fact that education in India is or has become as costly as education in any of the English Universities. It may be that when our Colleges were first established, *education* was imparted *gratis* but that cannot be said of the present and the Native public has to thank the Committee for noticing this subject in their Report and informing the Government of the fact that Native parents have now to exercise much self-denial in bearing the costs of the education of their sons.—*Indu Prugtsu.*

GIRL-GRADUATES.

THE theories of one age, it has been said, become the facts of another, and the common-place of a third; and the history of many of the now familiar results of applied science bears out the statement. The fancies of poets, too, have sometimes in the light of later events or discoveries seemed to be an almost prophetic anticipation of things to be; and there are not wanting persons who would almost credit Shakespeare with a foresight of the electric telegraph when, in using a poet's license to attribute superhuman powers to an imaginary supernatural being, he makes the fairies' messenger undertake to—

> "Put a girdle round about the earth
> In forty minutes."

But not to every man of science, still less to every poet, is it given to see the realisation of ideas which, whether in the conscious exercise of inventive skill, or in the unconscious workings of a lively imagination, he has thrown out upon the world. He writes, as a rule, or creates for posterity, and must be satisfied to seem a dreamer among his contemporaries. What, then, must Mr. Tennyson's feelings be when, now and again, as he takes up his daily newspaper, he realises that the charming visions of "The Princess" are beginning to take shape in fact—not, indeed, in some domain like that of Lady Ida's, far removed from the haunts of men, with its mimic organisation of academic society—

> "With prudes for proctors, dowagers for deans,
> And sweet girl-graduates in their golden hair;"

but in the more practical, if more prosaic, form of Newnhām Hall and Girton College at Cambridge, and the recently founded Somerville and Lady Margaret Halls at Oxford.

"Oh, I wish," exclaims Lilia, in the prologue to "The Princess:"—

> "O I wish
> That I were some great Princess, I would build
> Far off from men a college like a man's,
> And I would teach them all that men are taught;
> We are twice as quick!"

and the story, or "medly," which follows is represented as the half-jocular attempt of the young lady's friends to give shape to her wish. But the poet's fancy is so far prescient of what has actually come to pass, that just as that fabric of story and song seems to grow out of the girl's impulsive utterance, even so the edifice of higher and sounder education for women, the first courses of which are now being laid, is the outcome of the long-felt, often uttered aspiration of many women for educational advantages such as have hitherto been open only to men, and for at least the opportunity of making the best use of the talents they possess.

It is, of course, easy to laugh at this, as at any phase of the movement for the better education of women. The "girl-graduate" must expect for some time to come to be the sport of the satirist and the caricaturist, and an object of suspicion to old-fashioned people, who do not see what women want with any more learning than the old-fashioned modicum of music and French, and that mysterious accomplishment "the use of the globes." To look nice and get a husband—what more need a girl try for? It is also easy to point out objections, in the case of colleges for women, to the choice that has been made of the University towns for the *locale* of the experiment. We believe ourselves that Oxford and Cambridge are not ideally the best places in which to localise the higher education of women; for besides possible disciplinary difficulties, the close con-

tact and necessary contrast with the organisation of male education is likely to encourage invidious comparison between two things that need not be compared at all. But stronger than all argument is the pressure of *res angusta*. The choice of place is really a question of money. For a new and untried movement no large funds are at first available; and it is obvious that good teaching can be secured at far less cost in Oxford or Cambridge than if the Ladies' Colleges had each to maintain a staff of teachers in some other locality. Girton College, which was at first established at Hitchin, had, if we remember right, to be removed to the neighbourhood of Cambridge, owing to the difficulty experienced in obtaining the services of adequate lecturers.

Nor does it appear that the disciplinary difficulties have been found to be greater in or near a University town, or that the predicted dangers of unauthorised flirtation have been realised. A lecturer has, we believe been known to fall in love with and marry one of his pupils; but is there anything very dreadful in this, if the gentleman is able to maintain a wife, and the lady old enough to know her own mind? It is only what might equally have happened had he met her at a garden party or at the dinner-table of a friend; and we cannot see that the fact of such a thing having happened, or the possibilities of its happening again, constitutes a valid objection to the Ladies' Colleges. Yet one often hears it advanced in all seriousness as an argument against such attempts to give women a higher education.

As for the undergraduates we strongly suspect that they neither know nor care much *about* their sister-students, nor, except on very rare occasions, do their respective paths cross each other. At Cambridge, all below the Eighth Wrangler in the last Mathematical Tripos had the satisfaction of knowing that a young lady had beaten them, and probably of being well 'chaffed' by their friends in consequence. And a story comes from Oxford to the effect that the Union Society, that august assembly, the nursery of future orators and statesmen, was persuaded, by the over-zealous intervention of some of its members, to pass a vote allowing the use of its library to the two new Ladies' Halls; and not until the offer was formally made did it transpire that the favour had not been sought, and was not wanted. Whereupon, the story goes on to say, 'the House,' turned round and impeached its leaders, and then proceeded to a somewhat feminine retaliation upon the ladies, by passing a special vote that they should *not* have the use of the library. This may be an idle tale; though we have reason to believe it has a basis of fact. But be this as it may, we do not think that the juxtaposition of lady students and undergraduates in the same place will lead or does lead to more serious collisions than these; though, as we hinted before the handle which is thereby given to idle gossip and the invidious comparisons which are thereby suggested are perhaps sufficient to make Oxford and Cambridge, *ceteris paribus*, less desirable homes of women's education than other places.

It is easy enough, as we said, to make jokes upon this subject, easy enough to ask, "Why should women want to learn more than they do, or as much as men?"—but it is not so easy to answer the retort, "Why should they not?" We cannot go over again the well-worn discussion as to the right of a woman to the best attainable

cultivation of such intellectual powers as she possesses. But we should have thought that no one (except, perhaps, that philosopher who defined a woman as "an unreasoning being, who pokes a fire from the top," or the intelligent working man who occasionally kicks and stamps upon his wife) would deny that women have equal rights with men in this matter of education. Their brain power, it is said, is inferior to that of men. Be it so? but at any rate let them have a fair chance of trying what they can do. One of the Oxford Halls perpetuates the name of a woman whose powers equalled those of most men—the late Mrs. Somerville; and until a fair field is given to women in the educational race, we cannot know *for certain* that Mrs. Somerville's *congeners* are not somewhere "wasting their sweetness on the desert air" of French and German experienced masters, and the "usual accomplishments." The modes in which women's education should be imparted are still to a certain extent matter of experiment, and perhaps the attempts now being made may turn out not to be the best attainable. A girl's proper place, it is often said, is at home; why should she not be educated there? But in how many homes is the best education attainable, even for money? Is there an adequate supply of even decently competent governesses? And how are parents to know whether those who undertake to teach their daughters are duly competent, unless there is some recognised stamp, such as the Universities distinctions put upon young men, by which a woman's competency to teach may be approximately inferred? Is it not at least possible that Ladies' Colleges may answer this end? All these are considerations to weigh the hasty criticism which disposes of women's education with a sneer or a shrug.

Such criticism is surely as illiberal as it is premature. Surely men—above all, educated men—will rather be ready to hold out a helping hand to those women who are endeavouring in this respect to rise above the disabilities of their position, and to claim, not the illusory "rights" of the suffrage or the platform but the solid fruit of intellectual cultivation. Let us not condemn any attempts of whatever kind to realise this aim, until they are clearly proved to be failures. Let us rather hold out to them the hand of friendship and encouragement; and in place of gibes and jokes, address them in such words as Mr. Tennyson, in something of the prophetic spirit, has put into the mouth of his Princess:—

> "O lift your natures up:
> Embrace our aims: work out your freedom. Girls,
> Knowledge is now no more a fountain sealed:
> Drink deep, until the habits of the slave,
> The sins of emptiness, gossip and spite
> And slander, die. Better not to be at all
> Than not be noble."

Let woman at least have her fair chance; let her—

> "Make herself her own,
> To give or keep, to live and learn and be
> All that not harms not distinctive womanhood.....
> Till at the last she set herself to man,
> Like perfect music unto noble words."—*Guardian*.

MISCELLANEOUS.

At the last annual meeting of the Madras Senate one of the Fellow remarked that he saw from the Syndicate's report that the University had a Library; but he would ask—Where was it? for whose use? and how was access to it to be obtained? These questions do not appear to have elicited any reply.—*Bombay Record.*

Survival of the Fittest.—*Times Advertisement*:—"Governess required; English, French, German, Music. Liberal salary."

Three hundred applications received. Fifty selected, Applicants invited to be interviewed.

Advertiser (addressing hungry half hundred):—

"All those who are over twenty-seven may retire." [*Exeunt ten.*]

"All those who do not profess the higher mathematics may retire." [*Exeunt fifteen.*]

"All those who do not undertake the rudiments of Latin may retire." [*Exeunt five.*]

"All those who are not prepared to teach counterpoint and harmony may retire." [*Exeunt two.*]

"All those who do not undertake to ground in oil and water colour painting may retire." *Exeunt seven, leaving three.*

Advertiser. "I offer five-and-twenty pounds."

Exeunt two, leaving one, face to face with the liberal salary.—*Punch.*

APPOINTMENTS.

Ootacamund, June 25, 1880.

Mr. Henry Bidewell Grigg, B.A., C.S., to be Director of Public Instruction, in succession to Colonel R. M. Macdonald who vacates on promotion.

Ootacamund, June 22, 1880.

Mr. W. H. Wilson, Ph. D., Professor of Physical Science, 4th Class, Presidency College, to act as Professor, 3rd Class, during the absence on furlough of Mr. Garthwaite, Inspector of Schools, 3rd Class.

Mr. James Bradshaw, First Assistant Master, Civil Engineering College, to act as Inspector of Schools, 4th Class and to be in charge of the 6th Division, during the absence on furlough of Mr. Garthwaite.

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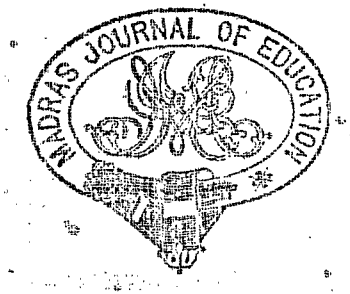

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THE MONTH.

In the Bye-laws of the University respecting the Matriculation and First Arts Examinations we read the following:—

> "A Certificate signed by the Registrar shall be given to each passed Candidate setting forth the date of the Examination, the optional language in which he was examined, and the class in which he was placed."

Every passed Candidate has therefore a right to demand of the Registrar such a Certificate, but we are credibly informed that in several cases it has recently been refused to youths applying after the middle of the year, and students are thus to their great injury prevented from proceeding to the higher examinations. For other Bye-laws of the University provide that when applying for admission to the F.A. test, each Candidate must forward a Certificate that he has passed the Matriculation Examination, and each Candidate for the B.A. Examination, must similarly forward a Certificate that he has passed the First Arts Examination. We are aware that a notice has been issued that Certificates will not be granted to applicants applying after the end of April, but we contend that for the Registrar to act upon such a notice is altogether illegal, as such a rule has never been passed by the Senate, and is therefore no Bye-law of the University. A regulation so capricious we feel sure could indeed never receive the sanction of the

Senate. Illness, or a thousand other accidents may occur to prevent a Candidate from sending in his application for his Certificate before the first of May. Or we will even suppose that he is guilty of negligence or forgetfulness, is it then right to inflict so tremendous a penalty as to injure his whole future life for the omission? We cannot conceive this to be the intention of the Syndicate, and doubtless in a case when the issue was so tremendous they would remit the rule. But why then make it? It has doubtless been framed to save trouble in the Registrar's Office, but surely such cases would be easily met by employing an extra clerk whose salary might be provided by the proceeds of a fine of four annas to be paid by each applicant for a Certificate who applies after the 1st of May. We commend this matter to the consideration of the Senate of the University at the earliest opportunity.

Some further modifications have been made by Government in the Regulations for the Middle-School Examination :—

(1) English will in future be an optional and not a compulsory language.

(2) The fee for the Examination in the case of pupils in schools will be Rs. 3 instead of Rs. 5.

(3) A first class certificate at the Middle School Examination will suffice for admission to the Special Tests.

The Matriculation Examination will be considered equivalent to a first-class certificate at the Middle School Examination as a qualification for employment in the public service, provided the Matriculates have passed the examination in handwriting prescribed in G.O., 8th April 1880, No. 104. No additional test in Arithmetic or Orthography will be imposed.

Candidates who have already passed a portion of the General Test will be allowed to complete it as provided by G.O., No. 680, dated 23rd May 1876, Revenue. The effect of passing this test will remain as heretofore.

The energy of the Headmaster of the London Mission High School at Vizagapatam in establishing a Reading Room for the Masters and Boys has called forth the official approval of the Inspector of the Division, and of the Director of Public Instruction. Such an example seems worthy of imitation in other Schools; a well ordered Reading Room in a part of the School premises could be established in nearly every

School, and the older boys as well as many of the assistant masters would be only too glad to avail themselves of a well lighted and ventilated apartment contrasting, in many cases, so greatly with the squalor and inconvenience of their own narrow dwellings.

We extract the following paragraph from the Inspector's Report on this School :—

"The teaching is in many respects thoroughly sound, the masters seemed enthusiastic in their work, and the discipline was excellent. The Headmaster has set on foot a Reading Room for the masters and boys, in which such magazines and books as can be obtained are taken. It is supported by small subscriptions from those who choose to join it. So excellent an example is worthy of imitation in other schools."

Meeting of the University Senate.—A full meeting of the Faculty of Arts was held in the Senate House on the 29th July, for the purpose of electing a President of the Faculty, and a new member in the place of Colonel Macdonald who has left India.

Mr. Fowler as Senior Fellow opened the proceedings, remarking that in the absence of a President, it was necessary for the Faculty to elect a Chairman; he begged therefore to propose that the Vice-Chancellor take the chair.

The Rev. W. Miller seconded the proposition, which was carried *nem. con.*

The Vice-Chancellor having taken the Chair, said the first business of the Faculty was to elect its President, and requested each member to write the name of his nominee. The papers were then handed in; and after scrutiny, it was found that the choice had fallen on Mr. Thompson, who scored thirteen votes, out of eighteen present. Mr. Thompson was therefore declared duly elected President of the Faculty of Arts.

The Vice-Chancellor next requested the Fellows to vote in the same manner for one of their number to be a Member of the Syndicate. Five of the Fellows had votes in their favour, but the choice fell on Dr. King, who scored eight. This closed the business of the meeting.

The Syndicate now stands as follows :—

The Hon'ble Sir C. Turner, *Kt.*, C.I.E., *President.*

Syndics in Arts.
- E. Thompson, Esq., M.A.
- Rev. W. Miller, M.A.
- The Hon'ble Mr. Justice Muttuswami Aiyar, B.L., C.I.E.
- H. B. Grigg, Esq., B.A.
- Surgeon-Major H. King, A.M., M.B.

The Hon'ble Mr. Justice Kernan, M.A., Syndic in Law.

Surgeon-General W. C. Cornish, F.R.C.S., Syndic in Medicine.

Colonel J. H. M. Shaw-Stewart, R.E., F.R.S.E., A.I.C.E., Syndic in Civil Engineering

THE RE-DISTRIBUTION OF GRANTS.—In Proceedings. No. 959, of the 5th March, the Managers of Aided Colleges and Schools were requested to send in applications for a re-distribution of grants under the Educational Grant-in-aid Code.

Some applications are still due, and until they are received the full effect of the re-distribution cannot be known. Some Managers have succeeded in re-distributing their grants so as to retain the whole in the same schools. Other have transferred grants not fully taken up in one school to some other school under the same management. In a good many cases the Managers have not been able to retain the whole of their original grants.

Several Managers of Middle Schools have placed them on the results system, and it is probable that the grants which they will draw under this system will be larger than the salary grants relinquished by them.

A general increase in results grants may be expected everywhere, especially in Vernacular Schools, as this in the first year in which maximum grants are combined with grants for alternative subjects in the third and fourth standards.

Certain lump grants withdrawn by Government from Local Fund Boards and Municipalities have been placed at their disposal for salary grants, but it is probable that this amount will not be fully taken up.

The Director proposes allotting any sums which may eventually be found to be available to the following purposes.

(*a*) Salary grants to girls' schools, and especially to new schools for girls and girls' schools, if any, which have hitherto received no aid.

(*b*) Furniture grants to such Colleges and High Schools as have not hitherto had such grants once.

(*c*) Grants to High Schools for the provision of apparatus for teaching physics and chemistry.

(*d*) Grants for gymnastic apparatus.

Applications for these grants may be submitted through the Inspectors of Schools and in the case of Girls' Schools in the town of Madras through the Inspectress of Girls' Schools.

UNIVERSITY OF MADRAS.—The undermentioned candidates have passed the Preliminary Scientific Examination held in July 1880:—Swaminatha Aiyar, V. K., B.A., Madras Medical College; Gurusingh, Arcot, B.A., Madras Medical College; Vaidyanathan, A. R., B.A., Bombay Grant Medical College and Madras Medical College; Pereira, John Charles, Madras Medical College; Poonen, T. Eapen, B.A., Madras Medical College.

The following candidates have passed the First L. M. and S. Examination held in July 1880:—Second Class: Viswanatha Patankar, Vitthala, Bombay Grant Medical College and Madras Medical College; Appaiya, Koravandra Muthanngh, Madras Medical College; Shapurjee Rustonji Kanga, Bombay Grant Medical College

The undermentioned candidates have passed the Second L. M. and S. Examination held in July 1880:—First Class. Lafrenais, Charles Arthur, Madras Medical College; Second Class. Dique, Richard Anthony, Madras Medical College; Ebell, John Henry, Madras Medical College; Hormusji Nowroji Contractor, Bombay Grant Medical College; Jamnadas Premchand Nanavati, Bombay Grant Medical College; Margenout, J. G., Madras Medical College; Sundar Atmaram Talpade, Madras Medical College; Vitthalrao Pandurang Mhatre, Madras Medical College.

Dr. WILSON, the Professor of Physical Science at the Presidency College, in an official letter to the late Director of Public Instruction, gives his opinion of what is "the greatest educational problem we have to solve."

The learned Professor draws in this letter a very gloomy picture of the state of Science teaching in the Presidency, and of the gross ignorance of teachers. It is well to see ourselves as others see us, and as Dr. Wilson speaks *ex cathedra*, we may be pardoned for quoting a portion of his letter here.

Speaking of the apparatus furnished to Government Schools Dr. Wilson writes:—

> "At the time that a portion of the Physics Primer was prescribed by the University for the Matriculation examination, it would have been well, I think, if only so much apparatus as is required to illustrate that portion had been got out from England—but having procured the complete set (in point of cost, about twice as much as was needed), it is a great pity that the part not at present in use was not kept in store, where it would have been properly taken care of, instead of being distributed among the various schools which received sets of Physical Apparatus. I say this, because I fear that comparatively few teachers understand the use of the instruments with which they have been supplied, or know how to take care of them, and it is but too probable that, when the whole of the text-book instead of half of it has to be taught in the Matriculation class (which I hope is not looking very far into the future), it will be found that in many cases the apparatus for illustrating Light and Electricity will have to be renewed. As the battery, the electric magnet, the voltametor, and one or two other things not at present used can be usefully employed in teaching Chemistry as well as Physics, I do not recommend, as I otherwise should, that the Physical apparatus not in use should be returned to head quarters and carefully kept and looked after until actually required, but I do strongly advise that strict injunctions should be issued to the Headmasters of schools to exercise due care in the preservation both of that apparatus which is in use and that which is not, and that the Inspecting staff should be requested to observe and report whether such injunctions are carried out. If you approve of my suggestion, the best method of giving effect to it will be to embody it in the next issue of the Standing Orders. I am impelled to make the suggestion because I am persuaded that the ends which the University had in view in prescribing this subject for the Matriculation Examination, viz., to bring the minds of the

pupils in direct contact with the facts and phenomena of nature by the aid of experimental illustrations, and so to develop the faculty of observation, are in too many cases completely frustrated through the incompetency of their teachers to perform the simplest experiment, and the apparatus in consequence lies unused and neglected. I do not make this statement inadvertently. I have examined in Physics and Physical Geography at the Matriculation Examination for the last four years, and have abundance of evidence to support my assertion, and the ignorance of these subjects displayed by the vast majority of candidates is grievous. The cause of this ignorance is unquestionably defective teaching, and how this teaching is to be improved—how an elementary knowledge of the laws of nature may be diffused among the population—is in my opinion the greatest educational problem we have to solve. We must look for future improvements by training men in a knowledge of these subjects, and I sincerely hope that the University may be brought to see the importance and the necessity of so doing, but in the meanwhile I should be glad to see some plan devised for teaching our existing teachers. This is scarcely the occasion for stating my views on this subject in detail, but I may perhaps be allowed to remark that, in some modified form or other, the method of teaching Science Masters practised by the Science and Art Departments in England, might be productive of valuable results in this country. This much however is certain, at the present time there is nothing worthy of the name of Science teaching in the Presidency, and, so far as Science teaching is concerned, the University has accomplished nothing."

Mr. Sutherland Orr has been proposed by the Judges to act for Mr. Morgan, the Deputy Registrar of the High Court Appellate side. Mr. Orr, who is a son of the late Major-General C. A. Orr, and a nephew of Inspector-General Orr, C.B., is a young gentleman of two-and-twenty, an articled clerk in the office of Mr. Barclay, the Government Solicitor. He was educated at Winchester School, and almost immediately after coming out to India in 1877, appeared for the Matriculation Examination of the Madras University, and took the proud position of First man in the First Class, heading more than two thousand candidates.

A telegram received in Madras announces the death of a well-known and respected educational officer of this Presidency. The late Mr. Adam Gordon landed in India as a recruit in one of Her Majesty's regiments, but after a few months experience of a soldier's life he purchased his discharge. He was of good family and had received a liberal education in one of the Scotch Universities and was a member of the College of Preceptors. At the time when the Presidency College was the High School of Madras and proficients were trained instead of Bachelors of Arts, Mr. Gordon was appointed one of the Professors. He was a man of an amiable disposition, and took a great interest in the pupils committed to his charge. On the retirement of the Rev. Mr. Percival from the office of Registrar of the University, Mr. Gordon was selected his successor by a large majority of the Senate. He resigned his post in 1875, and retired to

Scotland after upwards of twenty years' useful labor in India. Several of his pupils, on his retirement, presented him with an address of grateful acknowledgment for the interest taken by him in their educational progress and gave him as a *souvenir*, a very handsome gift. Many of the old alumni of the High School, which afterwards developed into the Presidency College, will hear with sincere regret that so good and kind a teacher has passed away.

Thomas Hughes has put into one incisive sentence the secret of the best teaching in primary school or college: "The worst education which teaches simplicity and self-denial is better than the best which teaches all else but this."

A Good Example:—Among the passengers by the British India Steamer *Mooltan* for London, which leaves the Madras Roads to-day, is Miss Priscilla Pedroza, daughter of Mr. F. B. Pedroza of Vepery, late Manager of the Revenue Settlement Office. Miss Pedroza is proceeding to England to qualify as a teacher, and, after obtaining a certificate, will return to India. She was formerly a teacher in the Doveton Girls' School.—*Mail.*

The puzzle of the period has its educational uses. It has been subjected to the scrutiny of several able mathematicians, and Professor Tait of Edinburgh has given his attention to the subject. At a recent meeting of the Edinburgh Royal Society, he read a paper on "The Theory of the Fifteen Puzzle," which is at present perplexing so many heads and fingers. The Professor began by stating that since he had given notice of his paper to the Council two papers had appeared in the *American Journal of Mathematics*, in which (as was only to be expected) most of what he had to say was anticipated. He showed that all the essential features of the puzzle were to be found in a board of four squares only, with three pieces, say A, B, C. It would be seen that no possible motions could disturb the cyclic order of these—i.e., they could only be a, b, c, or c, a, b, or b, c, a, and not anyone of a, c, b—b, a, c—c, b, a. Of the first three, anyone could be changed to another by two interchanges. Hence, all that was necessary in order to find whether a particular case of the puzzle could be solved or not was to find how many interchanges would bring it to the normal form. If that number be even, the problem was possible; if odd, impossible. Dr. Cross Brown had called those cases which were solvable Aryan arrangements. These involved an even number of interchanges; the others, or Semetic, an odd number. Any odd number of interchanges made an Aryan arrangement into a Semetic one, and *vice versâ*. Hence, when they could not solve a particular case, they had simply to turn the 6 and the 9 upside down, and all was right. We hope that our readers after this will plunge among the figures with the certainty of immediate success, and that they will not have the smallest difficulty in disentangling either a Semetic or an Aryan arrangement.—*The Schoolmaster.*

The Local *Journal of Education* records the indignation that has been excited in the Government Educational Department by the

appointment of a Civilian to the Directorship of Public Instruction, but remarks sagaciously "that the constant jealousy between the chief officers of the Department and the Aided Educationists has had much to do with the present appointment. An outsider, it has naturally been thought, would be the best man to hold the scales impartially between the contending parties." The controversy three years ago between Dr. David Duncan of the Presidency College, and the Rev. William Miller of the Christian College, was instrumented in opening the eyes of the Government and the public to the increasing rivalry between official and non-official educationists. Dr. Duncan had the best of the argument, but the Department gained and Mr. Miller lost nothing by his triumph. The *Journal* is probably right in supposing that the appointment of Mr. Grigg has given satisfaction to Managers of Aided Schools, who augur therefrom greater impartiality towards themselves.—*Madras Mail.*

NAMES OF SHAKESPEARE'S PLAYS.—*Memoriæ Technicæ.* (Omitting the Historical Dramas, "*quos versu dicere non est.*")

Cymbeline, Tempest, Much Ado, Verona.
Merry Wives, Twelfth Night, As you like it, Errors,
Shrew Taming, Night's Dream, Measure, Andronicus,
Timon of Athens.
Winter's Tale, Merchant, Troilus, Lear, Hamlet,
Love's Labour, All's Well, Pericles, Othello,
Romeo, Macbeth, Cleopatra, Cæsar,
Coriolanus.

THE MACDONALD MEDAL.

A MEETING of the Native community of Madras was held at Patchiappa's hall on the 26th July to adopt measures to recognise the services rendered in the cause of Education by Colonel Macdonald, the late Director of Public Instruction. There was a large attendance. The Hon'ble Mir Humayoon Jah Bahadoor, C.I.E., was in the chair. The Chairman in a few remarks explained the objects of the meeting.

Mr. RUNGANATHA RAO, in a short speech, moved the following resolution—"That the native community of Madras entertain a high sense of Colonel Macdonald's services in the cause of Education in this Presidency and are desirous of showing their appreciation of those services in a suitable manner."

Mr. ANANTHA CHARLU then made a short but interesting speech, and in seconding the resolution spoke of the policy adopted by Colonel Macdonald in respect to Education as being opposed to the system adopted by Missionaries.

Mr. RAMACHENDRA IYER moved the following resolution—"That a gold medal in the name of Colonel Macdonald be awarded annually in any college affiliated to the Madras University and which is conducted on a secular basis, to any student who in the B. A. Science examination for that degree obtains the highest number of marks."

Mr. PONNUSAWMY PILLAI seconded the resolution.

Mr. CHENTSAL ROW suggested the omission of the words "conducted on a secular basis" from the resolution on which there was a warm and animated discussion.

Mr. CHENTSAL ROW made the following remarks on the subject:—I fully agree with all that has been said of Colonel Macdonald's services in this Presidency. They *certainly have a claim upon our gratitude.* But is it necessary and is it proper to restrict the award of the prize to be granted in his name only to those graduates who prosecute their *studies in* Colleges where secular education alone is imparted? Would such a proposal be acceptable to Colonel Macdonald himself whom it is our object to honour? I, for one, think that it is neither wise, nor proper, nor just to exclude students of Colleges where religious as well as secular education is imparted. I say it is not wise, because the proposal must be distasteful to many of the members of our community, who were educated in, and who send their children to the Christian Colleges for education, and they would certainly be unwilling to contribute for a prize which their children are declared disqualified to compete for. It is not proper because we would be *returning evil for good.* The Missionaries are benefiting *us* immensely by giving us liberal secular, though coupled with religious education, and are thus entitled to our gratitude. Benefiting ourselves as we do from their labors, does it behove us, gentlemen, to think ill of them, and condemn the secular education they give because they teach their religion as well? Supposing the Missionaries withdrew from the field of their labors to-morrow, what would be the result? Can the Government, with the limited resources at their disposal, supply their place and spread education as fast as the labors of the Missionaries are accomplishing? That would certainly be impossible, and it is for this reason that the Government advocate the policy of spreading education by means of grants-in-aid. Of course, *no one would deny that* Government is a better judge of good education than the average man, and that as Government has the confidence of the people more than it is possible for any individual to command, Government Schools and Colleges would be more welcome to the people than those of the Missionaries. But as I have said above it is impossible for Government to do the entire work for the people, and from our past conduct it is clear that we have not the means or the wish to drive the Missionaries out of the field by founding our own Schools and Colleges. Then should we not appreciate their labors and be thankful to them for their having undertaken the work which *neither we ourselves nor Government* can do, and is it just to treat them as we do by declaring their students to be unworthy of the prize we are about to offer, whatever be their qualifications? It is true that the Missionaries mean to convert us to Christianity if possible, but certainly we must all admit that the aggregate amount of good they are *doing us* by spreading education is a great deal more than the evil supposed to be the consequence of conversions, which, after all are now of very rare occurrence. Moreover, is it a sin for men to try and convert people to their own faith? Are we not doing the same in some shape or other? What do the different sects *among the Hindus mean?* They all mean so many conversions from one religion to another. The founders of the Vaishnava religion made their conversions *by thousands,* and the process of conversion is still being carried on by them. Are the effects of these conversions by Vaishnavas less mischievous than those of the Missionaries in regard to domestic happiness? A Vaishnava cannot

eat or intermarry with a Smartha, and when a father becomes a Vaishnava, his own daughter married to a Smartha cannot eat with him. I will not say here whether Christianity is such a bad religion as to demoralize the people of this country, and whether secular education is less mischievous in its effects in destroying the structure of our ancestral religion, but I ask whether it is not natural and even honorable for every man to try and endeavour to bring others to the way he thinks to be right? I am not addressing those who believe that the Missionaries have some *chokkapodi* like the kidnappers said to be now employed by Government for stealing children to be sacrificed to the Harbour Works, and that therefore they deserve to be treated like the kidnapping Lubbais, but I ask the intelligent portion of the community, assembled here, whether it is not natural for every one to promulgate one's own views on so important a subject as religion, and if so why hate those who do their work from a sense of duty, and why refuse to recognize the good they do us in matters unconnected with religion? I do not mean that there are no black-sheep among the Missionaries, or that there have not been conversions from unworthy practices. But are we to cry down the whole class for the fault of a few individuals? I say the restriction proposed is not just, because we would be punishing the student for the supposed fault of the teacher. The poor student is not probably able to go to a Government College, or he thinks he may stand a better chance of passing by studying in a Christian than a Government College. He does not ask the Missionary to teach him the Bible, but he is nevertheless taught and he submits to it, because unless he learns it he cannot get his secular education, and yet we punish him and say, Oh! "you are a sinner, you have read the Bible, and we will not give you the prize. You may possess a good intellect, you may have labored well, but what of it, you have sinned in reading the Bible, and therefore you must be excluded." Is this proper? Well, it may be wrong for a Hindu by religion to read the Bible, but supposing a native, born of Christian parents, happens to be a student of a Christian College, why should he be excluded? It is no sin for him to read the Bible, and yet the resolution makes no exception in his favor. The fact is, gentlemen, that instead of taking a disinterested and broad view of the matter, and looking at it entirely from an educational point of view, we are allowing religious prejudices to ruffle the question. In these days when an atheist can have a seat in the British Parliament and a convert to Roman Catholicism represent a Protestant sovereign, I am sorry to find that our notion of religious liberty and equality is such that we cannot allow a student educated in a Christian College to compete for a prize offered to honor a friend of education who is also a Christian, and this for no reason other than that he reads in a College where Bible is taught; I shall not comment more on the subject but leave it to your dispassionate judgment. As to whether the proposal to which I take exception, will be acceptable to Colonel Macdonald or not, I cannot positively, say one way or the other, but can scarcely conceive that it would be acceptable to him. It is true that the Colonel set his face, and very properly, against the abolition of the existing Government schools which he thought the Missionaries aimed at, but which, however, they denied afterwards, but he never for a moment spoke ill of the education imparted by them, nor had he the least idea of discouraging Missionary efforts in educating our countrymen. He would, therefore, hardly like the idea of excommunicating, as it were, students of the Colleges where the Bible is taught in addition to the collegiate education imparted. For the foregoing reasons I propose that the words "conducted on a secular basis" be omitted from the resolution moved by Mr. Ramachendra Iyer and seconded by Mr. Ponnusawmy Pillai.

Mr. P. SRINIVASA RAO, who most heartily seconded the remarks and sentiments of Mr. Chentsal Rao, thought that by what was proposed to be done, the natives were only doing themselves harm, for should, at any time, a Hindu College or a Mahommedan College resolve to include religious teaching in its curriculum, it would at once be shut out from the medal. He considered religious teaching very essential. As for the religious teaching in the Mission Schools, he thought that the natives had no reason to alarm themselves when the number and nature of the conversions that had been made were considered. He had heard of famine boys being converted, but he did not think that any man with common-sense could be converted.

Mr. VENKATARAMIAH GARU observed that the object of the meeting was to approve of the policy pursued by Colonel Macdonald in regard to education, and that policy [illegible] the intentions of the conductors of Missionary Schools. It was necessary to express their appreciation of that policy. But if the form of the resolution were considered offensive, he would propose, as an amendment, that the medal be restricted to students in the Presidency College.

Mr. SOONDRUM SASTRIAR commented in somewhat strong terms on the remarks made by Mr. Chentsal Row. He maintained that the donors of the money for the medal had a perfect right to enjoin any restriction they pleased. Orthodox Hindus in their own houses would not do anything against the principles of their religion or caste which their servants might speak of, why should they publicly give their sanction to anything that militated against the interests of their religion? He thought that it behoved them to speak out their minds on the matter, and he felt that they would be applauded for their manliness. As for the suggestion that they should show a more catholic spirit, he did not think that the time had yet arrived for it. It would be time enough to be so liberal-minded when a Hindu father would be prepared to extend his hand to his son converted to Christianity and say to him, "I admire you for having exercised your discretion as to the religion you are to follow." That time had not yet arrived, and now a conversion simply meant an expulsion from the caste and a separation from one's family. These circumstances being considered, the conversion of one's child to Christianity was a serious matter, and he therefore thought that it was necessary to show in a marked manner their feeling against the real object aimed at by Missionary Schools. He, therefore, supported the original proposition.

Mr. VIZIARANGUM MOODELLIAR said that before Colonel Macdonald left Madras he incidentally mentioned to him what the natives intended to do in regard to restricting the medal to certain Colleges, and he approved of it.

Mr. JUSTICE MOOTHOOSAWMY IYER was pained to find that the proceedings of a meeting called for a special purpose should have

taken such an undesirable turn, and that the question of religion should have been introduced. He further regretted that some of the speakers should have made use of unnecessarily harsh words in referring to the conductors of Missionary Schools. It seemed to him that the conductors of Mission Schools made no secret of the real object with which they labored. If the schools were objected to by the nation, it was for the nation to withhold sending their children to them. As for the Missionaries, he would say, that, with all the faults that were attributed to them, they had done some good, and it was not proper that it should be entirely ignored. And he did not think that a medal of the value of twenty-five rupees would be a sufficient inducement to make boys give up the Mission Schools. Though he held such views, as he had all along shown at the preliminary meetings, he quite sympathised with the spirit that had dictated the resolution, but, he could not but say that he did not quite approve of the form in which the resolution was put before the meeting. He thought that the framers of the resolution did not take a right view of what the native community meant. The resolution seemed to limit the community to the parents of students attending the Government Colleges. There were also parents of students attending Missionary schools forming a portion of the community who were called upon to subscribe to the medal, and the resolution in its present form would be doing an injustice to them. He therefore suggested that a resolution should be framed in a manner so as emphatically to express the appreciation of the native community of the policy in regard to education adopted by Colonel Macdonald, but at the same time to leave the medal open to all Colleges affiliated to the Madras University.

Mr. RAGOONATHA ROW held that the original resolution did not reflect in the slightest manner on any Missionary body. Its object was to give emphatic expression to the appreciation of the native community of the policy in regard to education adopted by Colonel Macdonald. But he must admit that some of the speakers in the manner they discussed the subject left it to be inferred that there was an intention to cast a slur on Missionary bodies. Such, however, he would again say was not intended by the resolution, as the medal was open to a Brahman or Sudra, a Mahommedan or a Christian in the College in which it would be awarded. He supported the original proposition.

Mr. BALAJI ROW thought that the native community by the resolution proposed were making a bad return to the Missionaries, for they were to be considered the pioneers of Education in this country. It was they who taught the natives to speak English, and now that they were able to speak the language fluently they turned it against them. Colonel Macdonald, a Christian, treated the natives with a tolerant spirit in the policy he adopted. The natives would do well to copy him in this respect and be more liberal in their dealings towards the conductors of Missionary Schools.

Mr. CHENTSAL RAO's amendment being put to the meeting was lost, 13 voting for, and 30 against it; the original proposition was therefore carried.—*From the Madras Times.*

CORRESPONDENCE.

PHYSICS.

TO THE EDITOR MADRAS JOURNAL OF EDUCATION.

SIR,—Will any of your correspondents work out clearly for me answers to the following questions set to a Matriculation Class?

Yours faithfully,

BHASKARACHARYA.

I. What is meant by Elasticity? Which is more elastic, Ivory or India-rubber, and why?

II. A Chetty on the marriage of his daughter, wishing to give her a pair of bracelets of pure gold, employed a goldsmith to make them, giving him 5 ounces of gold. After the work was finished, the bracelets were found to weigh exactly 5 ounces in air, but when weighed in water they lost $\frac{1}{20}$ of their weight. Show how this fact proved that the bracelets were alloyed. It was afterwards discovered that the substance dishonestly used to alloy the gold was copper, find the quantity of copper used, and what was the specific gravity of the bracelets?

The specific gravity of gold = 19·26, and the specific gravity of copper = 8·56.

III. A lump of lead is weighed from both ends of an unequal balance, and its apparent weights are 9 lbs. and 16 lbs. Find the ratio between the arms.

NOTES ON TRIGONOMETRY.

I. Expand $\tan(A + B + C)$ in terms of $\tan A$, $\tan B$, $\tan C$.
(Todhunter's Trigonometry Art 113.)

$$\tan(A + B + C) = \frac{\tan(A + B) + \tan C}{1 - \tan(A + B)\tan C}$$

$$= \frac{\tan A + \tan B + \tan C - \tan A \tan B \tan C}{1 - \tan A \tan B - \tan B \tan C - \tan A \tan C}.$$

II. If $A + B + C = 180$, show that
$\tan A + \tan B + \tan C = \tan A \tan B \tan C$ (Art. 114)

$$A + B = 180 - C$$

$$\tan(A + B) = -\tan C$$

$$\tan(A) + \tan B = \tan A \tan B \tan C - \tan C$$

$$\tan A + \tan B + \tan C = \tan A \tan B \tan C.$$

III. If $A + B + C = 90$, show that
$\tan A \tan B + \tan B \tan C + \tan A \tan C = 1$ (Art. 114)

$$A + B = 90 - C$$

$$\tan(A + B) = \cot C = \frac{1}{\tan C}$$

$$\tan A \tan C + \tan B \tan C = 1 - \tan A \tan B$$

$$\tan A \tan B + \tan A \tan C + \tan B \tan C = 1.$$

IV. If A + B + C = 180, shew that

$\cos^2 A + \cos^2 B + \cos^2 C + 2\cos A \cos B \cos C - 1 = 0$ (Art. 115)

or $-\sin^2 A + \cos^2 B + \cos^2 C + 2\cos A \cos B \cos C = 0$

or $\cos(A+B)\cos(A-B) + \cos C(\cos C + 2\cos A \cos B) = 0$

or $\cos(A+B)\cos(A-B) - \cos(A+B)\{\cos C + \cos(A+B) + \cos(A-B)\} = 0$ which is obvious.

V. Reduce to its simplest terms

$$\frac{\cos 6\theta + 6\cos 4\theta + 15\cos 2\theta + 10}{\cos 5\theta + 5\cos 3\theta + 10\cos\theta}$$

(Mis. Ex. No. 218).

$$= \frac{\cos 6\theta + \cos 4\theta + 5\cos 4\theta + 5\cos 2\theta + 10\cos 2\theta + 10}{\cos 5\theta + 5\cos 3\theta + 10\cos\theta}$$

$$= \frac{2\cos\theta\cos 5\theta + 10\cos\theta\cos 3\theta + 20\cos^2\theta}{\cos 5\theta + 5\cos 3\theta + 10\cos\theta}$$

$= 2\cos\theta$.

VI. If $\tan(A+B) = 3\tan A$, shew that

$\sin(2A+2B) + \sin 2A = 2\sin 2B$

(Mis. Ex. 153).

$$\frac{\tan(A+B)}{\tan A} = 3$$

$$\frac{\tan(A+B) + \tan A}{\tan(A+B) - \tan A} = 2,$$

$$\frac{\sin(2A+B)}{\sin B} = 2$$

$2\cos B \sin(2A+B) = 4\cos B \sin B$,

$\sin(2A+2B) + \sin 2A = 2\sin 2B$

VII. Solve

$\tan 3\theta + \tan 2\theta + \tan\theta = 0$

(Mis. Ex. 141).

$$\frac{\tan 2\theta + \tan\theta}{1 - \tan 2\theta \tan\theta} + (\tan 2\theta + \tan\theta) = 0$$

$$\frac{1}{1 - \tan 2\theta \tan\theta} + 1 = 0$$

$$2 = \tan 2\theta \tan\theta = \frac{2\tan^2\theta}{1 - \tan^2\theta}$$

$$1 - \tan^2\theta = \tan^2\theta$$

$$\tan^2\theta = \tfrac{1}{2}$$

(Chapter XVI, Example 13)

VIII. Let A'C' intersect CB in E, and AB in F;

$$\frac{FC'}{BF} = \frac{\sin\frac{C}{2}}{\sin\frac{A}{2}}$$

$$\frac{BF}{FE} = \frac{\sin\frac{A+C}{2}}{\sin B} = \frac{1}{2\sin\frac{B}{2}}$$

$$\frac{FC'}{FE} = \frac{\sin\frac{C}{2}}{2\sin\frac{A}{2}\sin\frac{B}{2}} = \frac{\sin^2\frac{C}{2}}{2\sin\frac{A}{2}\sin\frac{B}{2}\sin\frac{C}{2}}$$

La Shastra.

THE CALCUTTA UNIVERSITY.

The Faculty of Arts of the Calcutta University have been engaged in the construction of a new scheme of University Examinations, and it is desirable that their suggestions should be thoroughly discussed before the Senate proceeds to a final determination on the matter. The new scheme seeks to realize the strong desire felt by Mr. Woodrow, the late Director of Public Instructions, to encourage the study of the physical sciences; but the actual effect, whether designed or not we cannot say, of the proposed limitations of subjects for the Courses in Arts, will be to choke scientific study, and virtually to re-cast the Calcutta University on the model of Cambridge and Oxford. Not that we should be disposed to regret this latter result. Our own feeling is, that the attempt to force the study of the physical sciences on the people of India is premature. Europe in the Middle Ages, before the rise of the new learning, and India at the present time seem intellectually to offer many points of close resemblance. That which emancipated the European mind from the old scholastic methods with their fruitless results, was the thorough literary study of the Latin and Greek languages. For, it was only after the minds of men had become saturated with classicism, that they grew strong, and began to reach forth to practical realities. What Latin and Greek was to Europe, that English seems likely to be to India. English literature must first saturate the mind of India before that mind will be familiar with those methods of thought that can alone help it to grapple successfully with scientific problems. The mere establishment of science examinations, will not promote the study of science. The only effect likely to be produced by the adoption of the new scheme will be to stimulate the study of English literature. It will not help the sciences. If the object be to work the Calcutta University on the principles recognized at Cambridge and Oxford, where the student is encouraged to reach high proficiency in some one department of

learning, the scheme will answer; but if the object be to follow on the wake of the London University, the scheme must be condemned. For example, the scheme proposed for the First Arts is as follows:—

A Course.	B Course.
1. English.	1. English.
2. A Classical Language.	2. Pure Mathematics.
3. History.	3. History.
4, 5. 1. A 2nd Course in English.	4, 5. 1. A Classical Language.
4, 5. 2. A 2nd Course in the Classical Language.	4, 5. 2. Analytical Geometry.
4, 5. 3. A 2nd Course in History.	4, 5. 3. Inorganic Chemistry.
4. A 3rd Language.	4, 5. 4. Physics.
5. Pure Mathematics.	
6. Deductive Logic.	
7. Philosophy.	

The objection to this arrangement is, that the A and B courses are nothing like equal. Where the same degree is given for different courses, they should, as far as possible, represent the same amount of labour, knowledge and developed intelligence. Now, the first three out of the seven optional subjects in the A course are merely continuations of the compulsory subjects. What comparison can there be between the work of a student who has chosen, say, 1 and 2 of the optional subjects, and one who has chosen 6 and 7? The labour of commencing a new subject is infinitely greater than that of simply extending the study of one with which familiarity has already been attained. In the B course No. 2 of the optional subjects, in the same way, fits on to the compulsory subject, pure mathematics, thus giving the student who selects the latter an unfair advantage over his fellow-student who selects some other optional subject. But with three continuations out of seven subjects, as compared with one out of four, the student who chooses the A course has manifestly an advantage over the student who chooses the B course. So far, therefore, from encouraging the study of the physical sciences, it seems to us that if the proposed scheme is adopted, the study of the physical sciences will be hopelessly neglected.

The Rev. W. Hastie, the Principal of the General Assembly's Institution, has suggested a scheme of his own in a letter to Mr. Croft, which has the advantage of being fair to all classes of students, and, at the same time, of being free from the clumsiness of the Faculty's scheme.

He proposes the following arrangement:—

F. A.	F. Sc.
1. English.	1. English.
2. A Classical Language.	2. Pure Mathematics.
3. History.	3. Experimental Physics.
4. Mental Philosophy.	4. Inorganic Chemistry.
5. One of	5. One of,
1st—Pure Mathematics.	1st—A Classical Language.
2nd—Experimental Physics.	2nd—History.
3rd—Inorganic Chemistry.	3rd—Mental Philosophy.

Here Mr. Hastie, proceeding upon the original lines of the proposed reform, *i.e.*, introducing the study of physical science at an early stage, separates the Arts and Science students at the very outset, and suggests two courses with corresponding degrees, but so that a student once fairly started must continue in the course he has chosen. It is a serious defect of the University Committee's scheme that a student may choose the B course of the F.A., and the A course of the B.A., and *vice versâ*, thus ensuing shallowness in every thing studied. The advantage of Mr. Hastie's scheme is, that the three compulsory subjects of the one course are the optional ones of the other. In this way the courses are equalized in respect of difficulty. The Committee's scheme looks as though it were framed to facilitate the escape of University students from all scientific study, and even from the study of elementary mathematics. But we do not agree with Mr. Hastie in his proposed introduction of Mental Philosophy into the F.A. course. It were better postponed to the B.A. course. F.A. students are not students in the true sense of the word; they are only schoolboys, answering to boys in the higher classes of English public schools, and not so advanced. Now, Mental Philosophy is not taught in English schools, and wisely so, because the boy's mind is not ripe enough for it. The Indian schoolboy would have the double disadvantage of having to master abstract ideas clothed in the subtle terminology of a foreign language.

The fault we have pointed out in the University scheme for the F.A., also exists in the provision for the B.A. The standards of attainment in the A and B courses respectively, and the amount of labour required to reach them, would be so unequal, that graduates would have nothing in common but the title. The optional subjects in the B.A., as in the F.A., will contain two which are merely continuations of the two compulsory subjects, so that it will be possible for a B.A. student to obtain his degree by simply taking up two English courses and a Sanscrit, or one English and two Sanscrit courses. The B course of the B.A. is not so bad, but we do not think that the couple, "Pure mathematics—Mixed mathematics," is fairly balanced by the couple, "Botany or Zoology or Geology with Physical Geography." Such a B.A. examination will not give fair results, some of the courses being so much easier than others.

Mr. Hastie proposes to reduce the B.A. subjects from five to four. He introduces, as compulsory subjects, Mental Philosophy into the A course, and Inductive Logic with classification of the sciences into the B course.

If the University must examine in physical science, Mr. Hastie's scheme is undoubtedly superior to the Faculty's. Better give the degrees for science as distinct from, but of the same value as, those for arts; and let the student who gives himself to science do so from the beginning. But we doubt the expediency of embracing the physical sciences in any scheme of University examinations, where the only element that can be tested is the candidate's power of "cram." What is the practical use of the zoology, geology, or botany that is learned merely out of a book? What is the educating value of chemistry, unless the student can make his own experiments? Such examinations can only result in increasing the already overgrown tendency to "cram." One of two things will

happen." If the examinations are so ordered as to test experimental knowledge, an overwhelming majority of the candidates will prefer the Arts course, and the Science course will not be worth maintaining: if, on the other hand, only acquaintance with text-books is required, students will take the Science course as the easier one, but they will acquire no real knowledge of science.

In fact, a knowledge of the natural sciences ought not to constitute a claim to a degree, any more than does a knowledge of engineering. These sciences are only technical. Long experience has shown, that it is the study of literature and of abstract sciences that lies at the foundation of the culture that it is desirable for universities to encourage. The breadth of intellectual perception, which will enable the mind to apprehend the value of knowledge in its different domains, and from which, as from an acknowledged vantage-ground, he may confidently advance into any specific territory, is all we ought to expect from any course of training to which an university invites its students.

But there is more in Mr. Hassie's scheme and in that of the Faculty, that we have yet commented on. We hope to come back to the subject at an early opportunity.—*The Star in the East.*

DOVETON PROTESTANT COLLEGE.

Senior F. A. Class.

SHAKESPEARE'S MIDSUMMER NIGHT'S DREAM.

Three hours.

I. (*a*) Give the dates of Shakespeare's birth and death, and of the publication of the two quarto editions of this play.

(*b*) When, by whom, under whose editorship, and under whose patronage was the First Folio Edition of Shakespeare originally published?

(*c*) Explain the terms Drama, Tragedy, Comedy, Farce, Interlude, Masque.

II. (*a*) What internal evidence is there for thinking *A Midsummer Night's Dream* one of Shakespeare's early pieces?

(*b*) What is the meaning of the title of this play?

(*c*) How far was our author indebted (i) to Plutarch, (ii) to Ovid, and (iii) to his English predecessors, in the composition of this play?

III. (*a*) Explain the names *elf, fairy, Oberon, Puck* and *Titania.*

(*b*) Draw up a list of the *dramatis personæ* in the 'tedious brief scene.'

(*c*) Fill up the blank in "Old——'s daughter Helena;" and account for the name.

IV. (*a*) What were, according to Titania, the consequences of the brawls between her and Oberon?

(*b*) What effect is attributed in the play to Cupid's, what to Diana's, flower? Are these flowers known to Botany?

(*c*) What are Choughs, Newts, Ounces, Reremice? Write notes on Griffin and Leviathan.

(*d*) What mistake does Shakespeare fall into with regard to the Glow-worm?

(*e*) In what sense is *adamant* used in the play?

(*f*) What is the *load-star*? Why was it so called? Give Milton's name for it.

V. (*a*) Give the references in this play to Queen Elizabeth.

(*b*) Write down the oft-quoted lines from the fifth act on the Power of the Imagination.

VI. (*a*) Give and explain the epithets used in the text for Autumn, the Cuckoo, Hecatë, the Ivy, the Knot-grass.

(*b*) Explain the *collied* night, *faint* primrose-beds, *orient* pearls, *patched* fool, *pelting* river, *injurious* Hermia, *transparent* Helena.

(*c*) Who or what are addressed or described in the text as Aurora's harbinger — this canker-blossom — the false Troyan — hempen homespuns — this kill-courtesy — thou lob of spirits — most lovely Jew — thou my surfeit and my heresy — O sisters three — tawny Tartar — testy rivals — your buskin'd mistress? Give reasons (if you think them necessary) for these epithets.

(*d*) Why is Cupid painted blind? Why winged? Annotate —"By his best arrow with the *golden* head."

VII. (*a*) Give the history of *argument, cue, dowager, henchman, 'ewel, livery, mewed, pensioner, quaint, wanton.*

(*b*) What words (no longer used or but very rarely used in the same way) are found in this play for *thicket, immediately, ill-tempered, love, frolicsome, mechanics, lively, figure,* (or personal appearance), *quarrel, constantly, festive show, untrained*?

(*c*) Give two examples (one being taken from our play) of each of the obsolete words *gleek*—*lock* or latch—*mere* or mean—*momentany*—*neaf*—*neeze*—*wud*, wod, or wode.

(*d*) What mistakes does Bottom make in the use of *aggravate, condole, exposition,* and *obscenely*; and what does he say instead of Cephalus, Hercules, Phoebus, and Leander?

VIII. Paraphrase:

We, Hermia like two artificial gods,
Have with our needles created both one flower,
Both on one sampler, sitting on one cushion,
Both warbling of *one song*, both in one key,
As if our hands, our sides, voices, and minds,
Had been incorporate. So we grew together,
Like to a double cherry, seeming parted,
But yet a union in partition;
Two lovely berries moulded on one stem;
So, with two seeming bodies, but one heart;
Two of the first, like coats in heraldry,
Due but to one and crowned with one crest.

IX. Examine the subjoined Folio readings:—

(*a*) But earthlier happie is the Rose distil'd.

(*b*) Emptying our bosomes, of their counsell sweld:
There my Lysander, and my selfe shall meete,
And thence from Athens turne away our eyes
To seeke new friends and strange companions.

(*c*) The humane mortals want their winter heere,
No night is now with hymne or carroll blest.

(*d*) Transparent Helena, nature her shewes art.

(*e*) If thou hast slaine Lysander in his sleepe,
Being ore shoes in blood, plunge in the deepe, and kill me too.

(*f*) ———— thy hand. O let me kisse
This Princesse of pure white, this seale of blisse.

(*g*) Thy threats have no more strength then her weak praise.

(*h*) No, my noble Lord, it is not for you. I have heard
It over, and it is nothing, nothing in the world;
Unless you can finde sport in their intents,
Extreamely stretcht, and cond with cruell paine,
To doe you service.

(*i*) Then know that I, one Snug the Joyner am,
A Lion fell, nor else no Lions dam.

Senior F. A. Class.

SHAKESPEARE'S MIDSUMMER NIGHT'S DREAM.

GRAMMAR.

Three hours.

I. (*a*) Simply write down the usual Shakespearian spelling of *antique, apricot, avow, age, bankrupt, choir, lantern, margin, only, swoon.*

(*b*) How did the Shakespearian pronunciation (at least in this play) of *business, edict, laugh, needles, persevere, revenue, rheumatic, sinister* differ from ours? (Support by quotations.)

(*c*) Which of the forms (i) *funeral* or *funerals*—(ii) *nuptial* or *nuptials* is usually found in our author?

(*d*) Notice separately all the peculiarities in—

Whereat with blade, with bloody blameful blade,
He bravely broached his boiling bloody breast;
And Thisbe, tarrying in mulberry shade,
His dagger drew and died.

II. Quote from the play read one illustration of each of the following:—

(*a*) *Ry* [*ru, re*] sometimes marks the plural of nouns.

(*b*) The possessive ending *es* [*ue, ys, is*] is made a distinct syllable in the older stages of the language.

(*c*) Double comparatives are common in Elizabethan English.

(*d*) *Self* is properly an adjective

(*e*) *Other* is found as a plural form.

(*f*) *Other-some* was used for 'some others'

(*g*) *His* was freely used for 'of him.'

(*h*) The termination *en* was the mark in the Midland Dialect of the plural number of verbs.

III. Explain the subjoined uses of the infinitive:

I serve the fairy queen to dew her orbs upon the green.—Is there no play to *ease* the anguish *of* a torturing hour.—Walls are so wilful to *hear* without warning.—I have a device to *make* all well.—Cupid is a knavish lad thus to *make* poor females mad.—I wonder if the lion be to *speak*.—I thought to *have spoke* thereof.—How long within this wood intend you *stay*?—Weed wide enough to *wrap* a fairy in.

IV. (*a*) Give the origin and meaning of the adverbs *anon, as, ere, else, extempore, nowadays, perforce, seldom, since, then, therefore, thrice.*

(*b*) Write a note on the conjunction *an.*

V. Give the full force of the prepositions in.

(*a*) A very gentle beast and of good conscience—Bracelets of thy hair—I am beloved of beauteous Hermia—I shall desire you of more acquaintance—I wonder of their being here together—If you think I come hither as a lion it were pity of my life—Is not this the day that Hermia should give answer of her choice—Of force she must be eyed—Of thy misprision must perforce ensue some true love turned—Pale of cheer—So I, admiring of his qualities, also err—Speak of all loves.

(*b*) They now have toiled with this same play *against* your nuptial.—A fair vestal throned *by* the west.—Ah me! *for* pity.—Steal *forth* thy father's house.—Nor mark prodigious such as are despised *in* nativity.—He may prove more fond *on* her.—He cannot be heard of; *out of* doubt he is transported.—Now thou and I will dance in Theseus' house and bless it *to* prosperity.—I'll follow thee and die *upon* the hand I love so well.—You faint *with* wandering in the wood.—A mile *without* the town.

VI. (*a*) *In* may be either of two parts of speech in the sentence, "Here come two noble beasts *in* a man and a lion:" explain.

(*b*) Distinguish between the two *alongs* in "Go *along*" and "This coil is *'long* of you."

(*c*) Parse *needs* in—"Therefore you must *needs* play," and in "Your play *needs* no excuse." Account for the *s* in each word.

(*d*) Which form—*never so* or *ever so*—is preferable in

"Never so weary, never so in love,
I can no further crawl, no further go;

and which in "It refuseth to hear the voice of the charmer, charm he never so wisely?" (Give reasons.)

VII. (*a*) What is the modern distinction between the interjections *O* and *Oh*?

(*b*) Trace the origin of the interjections By'rlakin, Forsooth, Gods-my-life, Marry.

(*c*) Is it possible for interjections to have cases after them?

Class I.

COLLINS' CICERO.

Two hours.

I. (*a*) Give the dates of Cicero's birth, assumption of the *toga virilis*, Sicilian quaestorship, praetorship, consulship, exile, and assassination.

(*b*) What do we know of Cicero's father, wives, and children?

(*c*) What explanations have been put forward of the cognomen *Cicero*?

II. (*a*) In what sense is it true that "the letters and orations of Cicero are not ancient at all"?

(*b*) "In his family and social relations, the great orator wins from us an amount of personal interest and sympathy which he fails sometimes to command in his career as a statesman": why?

(*c*) "A philosopher does not always find in himself a ready pupil": in what connection does Mr. Collins use this?

III. (*a*) How were Aculeo, Aesop, Archias, Atticus, Laenas, Metellus, Murena, and Scaevola connected with Cicero?

(*b*) Write a short notice of the woman Mr. Collins calls "the Roman Jezebel."

(*c*) Explain *juris consultus—novae tabulae—novus homo—sella curulis—ultimum decretum*; and say what the *Cincian*, *Porcian*, and *Sempronian* laws appealed to in the Verrine orations provided.

IV. Write a general introduction to the Verrine Orations—*or* to the Catilinarians—*or* to the Philippics.

V. (*a*) Explain and illustrate *climax*, *euphemism*, *pun*.

(*b*) What do you mean by the "argumentum ad hominem," "argumentum ad verecundiam," "argumentum ad populum"?

VI. Write short biographical notices of Burke, Chaucer, Erasmus, Middleton, Montaigne, and Niebuhr.

VII. Give the history of the words *control*, *dais*, *eyot*, *gear*, *grange*, *maxim*, *mob*, *pawl*, *redolent*, *sarcasm*, *saunter*, and *suffrage*.

VIII. Explain

(*a*) Briefs came in upon the young pleader almost too quickly.

(*b*) *Soi-disant* patriots.

(*c*) The jury [in Rome] were the judges both of law and fact.

(*d*) He interposed a tribune's 'Veto.'

(*e*) The Louis Quatorze Style.

(*f*) A man like Cicero was very good company, and somewhat of a lion besides.

(*g*) The two parties walked the streets of Rome like the Capulets and Montagues at Verona;

(*h*) The letters of condolence from well-meaning friends were to him as the speeches of the three comforters to Job.

(*i*) "Would that you had invited me to the banquet on the Ides of March! There would then have been no leavings from the feast."

(*j*) His treatise De Officiis (a kind of pagan 'Whole Duty of man') is also of this date.

MAHARAJA'S HIGH SCHOOL, MYSORE.

Matriculation Class.

ALGEBRA.

An hour and a half.

Examiner—M. A. Sreenivasa Iyengar, B.A.

I. Simplify

$$\frac{x-3y}{6x^2-11xy+4y^2}+\frac{x+y}{12x^2-25xy+12y^2}-\frac{2(x-y)}{8x^2-10xy+3y^2}$$

II. (*a*) If px^2+qx+r and rx^2+qx+p have a common factor of the form $x+a$, show that $p+r=q$ and $a=1$

(*b*) Show that

$$(3a-2b)^2(4a^2-4ab+b^2)+(2a-b)^2(9b^2-30ab+25a^2)+(3b-5a)(9a^2-12ab+4b^2)$$

is a perfect square.

III. (*a*) If $a+b+c=\frac{1}{ab+ac+bc}$ and $a=\frac{1}{2b}$

Find the Numerical value of

$$(a+b)(b+c)(c+a)$$

(*b*) If $x+y=3-y$ find the value of

$$x^3+18xy+8y^3-27.$$

IV. Solve

(1) $\frac{a(x^2+4)}{2}=\frac{x(a^2+b^2)}{b}$

(2) $ax+by=cxy$

$by+cz=ayz$

$ax+cz=bxz$.

V. Two trains, the lengths of which are respectively m and n yards, pass each other in "a" seconds when they move in the same direction, and in "b" seconds when they move in opposite directions. Find the rates per hour in miles of the trains.

Matriculation Class.

Poetry and Prose.

I. Rewrite the following, changing the Direct into Indirect and the Indirect into Direct Narrative:—

It came into his head that he had himself fought just six battles against the English and their allies, and that the poor persevering spider was exactly in the same situation with himself, having made as many trials, and been as often disappointed in what it aimed at. "Now," thought Bruce, "as I have no means of knowing what is best to be done, I will be guided by the luck which shall attend this spider. If the insect shall make another effort to fix its thread, and shall be successful, I will venture a seventh time to try my fortune in Scotland; but, if the spider shall fail, I will go to the wars in Palestine, and never return to my native country more."

II. Paraphrase the following passage, and parse the words in italics:—

"*Fast* they come, fast they come,
See how they gather!
Wide waves the *eagle* plume
Blended with heather.
Cast your plaids, draw your blades,
Forward each *man Set*.
Pibroch of Donuil Dhu,
Knell for the onset."

III. Explain the following quotations taking care to make the sense clear:—

(*a*) "He is gone on the mountain,
He is lost to the forest."
(*b*) "The ring they ride."
(*c*) "Wrought and chased with rare device."
(*d*) "I read you for a bold Dragoon."
(*e*) "A wet shroud swashed round ladye gay."
(*f*) "I dare be bound *again*, my soul upon the forfeit."
(*g*) "She said mercy became monarchs better than their crowns."
(*h*) "Loch Lomond is said to have been the scene of such a lecture."
(*i*) "The Scots stood their ground."
(*j*) "His own eldest son was called Edward after himself."

IV. Analyse:—

'Twas long before the customers
Were suited to their mind,
When Betty, screaming came down stairs,
"The wine is left behind."

V. Sketch the character of Shylock or of Bassanio.

VI. Give some instances from the Tales of a Grandfather in which the writer violates English grammar or idiom.

VII. Make one short sentence for each of the following words, using the word in the same sense as that in which it occurs in your text:—

(a) Pommel; (b) deign; (c) express; (d) maintain; (e) incident; (f) plaudits.

VIII. Give the opposites of the words italicized:—

(*a*) This *artful* and *ambitious* prince.
(*b*) The violence of national *antipathy*.
(*c*) Upon hearing this *haughty* answer.
(*d*) The flat side *uppermost*.
(*e*) *Dexterity* in fishing.
(*f*) He endeavoured to *free* his countrymen.

IX. Give from the poetry examples of the following figures:—

(*a*) Personification; (*b*) Synecdoche; (*c*) Metaphor; (*d*) Simile; (*e*) Euphemism.

Write clear definitions of each of the above terms, and state the distinction between a rhetorical and a grammatical figure, giving examples.

Physics.

I. Give a definition of *sound* and explain the phenomenon briefly and clearly.

II. Distinguish between (1) a *noise* and a *musical sound*, (2) a *high note* and a *low note*.

III. What is an echo? why is it sometimes heard and sometimes not?

IV. What is meant by the velocity of sound? Is it constant? On what does it depend? Illustrate.

V. Precisely at 8 o'clock every night a gun is fired at Fort Saint George and at St. Thomas' Mount; a person standing between the Fort and the Mount hears the report from the former 2" after 8 and from the latter 3" after 8. How far is the Mount from the Fort?

VI. Explain the following facts:—

(*a*) A bell rung under water has been heard at the distance of 9 miles. Out of water, it could not have been heard perhaps at the distance of ¼ of a mile.
(*b*) A bell rung at one end of a long tube gives a double sound.

VII. An echo is heard 5" after a sound is raised. How far is the reflecting surface.

VIII. A gun is fired from a ship at sea and a person standing on the shore hears the second sound 4½" after the first. How far is the ship from the shore?

ON EXAMINATION MARKINGS IN ARITHMETIC.

Regarding an exercise in arithmetic, there are four things necessary: (1) that a pupil should know how to do it, and, to a certain extent, why he so does it; (2) that he should do it accurately; (3) that he should do it expeditiously; (4) that he should do it neatly. A knowledge of the method self-evidently lies at the basis of the pupil's *progress*, but it is as evident that the reason of the method cannot always be unfolded to him, for while it is desirable that arithmetic should as much as possible be made a means of disciplining the reason, we are often "forced to deviate from the strictly logical arrangement, and suit our *proceedings* to the powers and aptitudes of the human mind." After a knowledge of the method is acquired, it is next in importance that the pupil should be able to put his knowledge into accurate practice, and then it will be added

tional points in his favour, if he do so with as little loss of time, and in as presentable a manner as possible. Of these four points of *method*, *accuracy*, *rapidity*, and *neatness*, the last two are of no arithmetical value without the second, in which, of course, the first is implied, but this first, as is evident, may subsist by itself. In inquiring into a pupil's arithmetical power, it will therefore be well if, in forming our judgment, we do not ignore that which has a definite value of its own.

Thus, in examining an exercise, if it has been done accurately, would it be right to estimate its value at nothing because it has not been neatly performed? "Certainly," says a writing-master, "nothing is so slovenly as the careless setting down of accounts." Now this, while quite right in fact, would be quite wrong in application. For, while it is not only true that the want of neatness is not only reprehensible in itself, but it is also a fruitful source of error; it is to be observed that our present remarks do not refer directly to what the pupil *should do*, but to what he has in any given exercise *done*. To reject a slovenly exercise, though correct in result, would be giving nothing for the arithmetical power employed in its solution; and if the object of the examination is to test the arithmetic of the pupil, it is evident that it would be defeated by cancelling accuracy, and it may be rapidity, for want of neatness. Again, we have often seen a boy of slow but steady working habits produce the correct answer to an exercise after the time allotted for its solution had expired. Now, in an examination, it would give no fair idea of the true state of a boy's arithmetic were nothing proportionate allowed for the accurate work he may have accomplished in the given time. Thus, if six questions were prescribed for solution, one being read every ten minutes, it would give as incorrect an idea to allow nothing for the accurate partial work of those who required twelve minutes for the entire solution of each; as it would to reject those who had not done all the six when the whole were at once prescribed for the hour. Independently, therefore, of neatness and rapidity, we must allow for accuracy; but the question now comes, Are we to allow for a knowledge of method accompanied with inaccuracy in work?

Suppose a pupil, in writing out a proposition in geometry, were to fail in one step, would it follow that he knew nothing about it; and would it be fair, in reckoning up the marks of the examination, of which this proposition formed one of the exercises, to give him no mark for it—no fractional part whatever of the total value assigned to it? And suppose further, that the examination were a general one, in which geometry formed one of the subjects, and that the questioning in this department were limited to the *one* proposition, would it present a correct view of the case to say that the geometry in this pupil's case was a total failure? It is so evident, that a pupil who had written out the whole proposition with only one mistake, should fare better than his compeer who had not even attempted the "particular enunciation;" that no one when he had a number, say "16" or "20," for the whole value at his disposal, would purposely assign "0" in the case proposed. If so in geometry, how then in arithmetic?

Would it be right to reject an example worked by the correct method, in which a slight slip occurred in the figuring? By totally

rejecting it, the pupil who had thus done it would be placed on the same level as he who had not even attempted it. By such a plan, if in a class of *ten* boys, *six* did an example correctly, *three*, while showing that they knew the method, made a slip in the figuring and *one* did not do it at all, the last four would be represented as total failures. Now, it would be true to say, that of the ten boys, only six did the example correctly; but would it be fair to write "0" for the work of the three foresaid boys, and thus produce the impression that only six knew anything about it? As well might a cantatrice, by failing in one note, be set down as incapable in vocal music. Tried, too, by such a plan, every rifleman who did not hit the bull's eye would get nothing for any other point in the target,—nay, might be declared as incompetent in musketry.

"But," says some one, "if a boy, who becomes apprentice to a grocer, makes out a customer's account, with an error of a shilling or so on the one side or the other, what will it avail him to say to his master, 'Please, sir, I know the method, but have just made a little slip.' Would the reply not be, 'What do I care for your method, unless you can work it right?'"

Now, is it to be taken for granted from this one slip, that the boy has on no occasion cast up an account correctly, and that in short he is totally incompetent in arithmetic? Will the grocer have so little hope that he will ever produce a correct result, that, as soon as submit the next customer's account to him, he would as lief hand it to the porter, who, mayhap, knows nothing whatever of arithmetic? But the grocer with his apprentice is not an apposite case to the teacher with his pupil; the grocer has to do with results only, the teacher has to do with *methods as well as results*. And as Mr. Sang of Edinburgh, in the preface to his *Elementary Arithmetic*, has said, "in very many cases, the manner in which the result is worked out is of more importance than the mere obtaining of it." This commends itself to every one who has had experience in teaching and who looks on education, not as a mere process of *cramming*, or of producing results, but as a means of disciplining and *drawing out* or *educating* the powers of the mind.

There is indeed one case in which, in an examination, nothing might be allowed for anything but accurate work, and that would be in a special examination, simply for accurate answers in arithmetic, and not for the general subject itself; in the same way as in rifle matches, there may be special competitions for bull's eyes, exclusive of other hits. The field being then limited to correct answers, a "0" under it would be understood merely to imply a want of perfect accuracy. But if to the part we gave the name of the whole; if to an arithmetical examination, conducted in a special way, we gave the name of a general examination in arithmetic, we convey an erroneous impression, and make a failure in the part appear to be one in the whole. Whereas, if we wish to conduct a general examination for testing the arithmetical power of the pupils, we should not limit our inquiries merely to the accuracy of result, but should make the allowance for the knowledge of method displayed in the working.

Now, if this is applicable to the teacher in arriving at a knowledge of the individual attainments of his pupils, it is much more applicable to an examiner when passing a teacher's work under review.

For if it is unjust to the pupil who makes a slip in the working to place him on the same level as the one who is utterly ignorant of the whole exercise; it is no less unjust to the teacher, for it gives to the result of his labours a much less than their true value. The manner in which a pupil works an example bears the impress of his teacher more distinctly than the figures of the result. Indeed, the accuracy of the working depends, not merely on the opportunities for practice, but very much too on the arithmetical bias of the pupil. We need not look for the same richness of perfume from every rose; for the same weight of crop from every kind of soil; or for the same accuracy of hitting from a Brown Bess as from a Whitworth rifle. Principal Forbes of St. Andrews, in once speaking of a student, said, "I had reason to ascertain his *great expertness and accuracy as an arithmetician*. Judging from my experience, I should say that *this is by no means so common a talent as it is often supposed to be*." To speak phrenologically, if a boy has not a good organ of "number," there is little chance of a teacher's making him either as expert or accurate an arithmetician as one better endowed. And if, by the exertions of the teacher, the boy is brought to apprehend the manner of working, it will not produce a correct impression of the teacher's labours if, at a general examination of the arithmetical capabilities of the pupils, *no value whatever* is to be given for this work unless accompanied with perfect accuracy.

But lest it should be said that we present too low a standard by allowing for less accuracy, it is important to repeat that the object of the examination is simply to discover and allow for everything that the pupil can put forward on the subject. It does not follow, that because a knowledge of method is accompanied with inaccurate practice, the teacher should not, during the ordinary everyday work, insist on such additional practice and preparation as shall induce accuracy; but it does follow, that at a set examination of the kind proposed, some approximate value should be given for the true work he may have accomplished. As to the everyday work, the teacher, as the *generator of progress*, cannot set up too high a standard. Then the motto should be—"*I can't*" never did anything. "*I'll try*" has worked wonders. "*I will do it*" has performed prodigies. But at these set examinations, the teacher or the examiner, as the *registrar of results*, while he gladly notes all prodigies and wonders, should not ignore the result of the smallest trials. The proverb says, "Bid for a silk gown, and you are sure of the sleeve." The teacher may keep the idea of the gown everyday before the mind of his pupils without refusing to measure the sleeve when they produce it.

In conclusion, if what we have said holds good in practical arithmetic, it applies with double force to theoretical arithmetic, in which the reason of the method is unfolded as the basis of its practice, and as we have already, by way of illustration only, alluded to geometry, the same might be applied and enlarged in the various departments of mathematics.—*The Museum.*

ON THE STUDY OF CHEMISTRY.

(Concluded from page 270.)

In giving you a brief outline of the influence which the study of chemistry, by the development of the manufacture of sulphuric acid and of coal-gas, has exerted on the progress of civilization of the present time, I have selected as illustrations two branches of industry, which are essentially of modern growth. Let us now glance at the benefits conferred by the development of chemistry on some of the arts, which formed the legitimate pride of antiquity.

Take *architecture* as an example. In Rome this art had reached the highest degree of perfection. The temples, the theatres, the aqueducts of the Roman architects, half ruined as they have been handed down to us, are justly admired as glorious monuments of their taste, of the vastness of their conception,—of their constructive powers. It is generally believed that the Romans have been the inventors of the ordinary mortars, some of their earlier buildings being constructed without the intervention of mortar. They certainly discovered the hydraulic mortars, which they subsequently used in all their marine buildings. The material originally used by the Romans in the preparation of hydraulic mortars, was the volcanic rock with abounds in the neighbourhood of Vesuvius, more especially near the town of Puteoli, the Puzzuoli of modern times. Ground to a fine powder and mixed with slacked lime, the dust of Puteoli, *pulvis Puteolanus* has the remarkable property of hardening under water. When the Romans penetrated into Germany, they found the same material in the valley of the Rhine and in the volcanic districts of the Eifel. For nearly 2,000 years the rocks of Puzzuoli and the trass-quarries of the Rhine were the only sources from which this valuable article could be derived. It was reserved to the science of our own age to unravel the mystery of hydraulic mortars. The attention of scientific inquirers was forcibly drawn towards this subject, when, at the close of the last century, Parker and Wyatt made the important discovery that the calcareous nodules, which are found in the clay of the London basin may be converted by simple burning into an excellent hydraulic mortar which had moreover the advantage of requiring no addition of lime. Patented in 1796, this discovery led to an important branch of industry—to the manufacture of "Roman cement." The question of hydraulic mortars had entered upon a new phase by becoming the subject of scientific investigation. Geology and chemistry were appealed to, and it was not long before a satisfactory answer was obtained. Several observers have participated in this examination, but it was not until a prize, proposed by the Society of Harlem, elicited in 1828 the classical inquiry of Fuchs, and based the production of artificial hydraulic cements upon a scientific foundation. It would transgress the limits of this fugitive sketch were I to trace, step by step, the gradual development of the chemical theory of hydraulic cements; the question has been very ably discussed by Prof. Pettenkofer,* who in our own days has materially assisted in the final elucidation of this subject. Suffice it to say that the conditions involved in the solidification of water-mortars are now known, and that every

* Popular Lecture.

country possesses the materials for the artificial production of what was once the monopoly of the bay of Naples and the valley of the Rhine.

I might go on for hours quoting illustration after illustration, but I must limit myself to pointing out a few of the advantages which the most important branch of human industry, *agriculture*, owes to our science. At an epoch when the resources of the agriculturist seemed almost exhausted, chemistry offered her hand, to lead him on a new ascent of improvements. An accurate study of the composition of plants, taught us the actual nature of their food,—that it was partly obtained from the atmosphere, and partly from the soil. It taught, likewise, that while the nutriment derived from the air (identical for all plants), is continually restored to it by the never-ceasing processes of respiration, combustion and putrefaction; the mineral aliment (varying with each vegetal species), is drawn from a source which is liable to exhaustion. The knowledge of the importance, to the development of plants, of a due supply of their mineral constituents, implied the recognition of the necessity of faithfully restoring to the soil such inorganic matters as are removed from it in our crops. This principle sealed the pledge of alliance between agriculture and chemistry. To keep up the fertility of his fields, the cultivator of the soil had to make himself acquainted with its general composition, as well as with the nature both of the particular substances which he is annually extracting from it, and of those with which he must supply the loss. For each of these purposes the aid of chemistry became indispensable to the farmer. Davy's excellent work on agricultural chemistry first called the attention of the more intelligent British farmers to the value of chemistry in the improvement of their art, but it is only within the last twenty years that the attention of agriculturists has been generally directed to the subject, more particularly by the works of Liebig and Boussingault. The nature of manures once clearly defined, almost every agricultural improvement at which practice had arrived by slow degrees, received a satisfactory explanation, whilst a variety of improved applications necessarily suggested themselves. The principles of following and of the rotation of crops, and the theory of soil-burning, are no longer mysteries; the action of lime, of wood ashes, and of bones is now perfectly intelligible. In this country, too high a value cannot be set upon the discovery of new sources of material convertible by the farmer into human food. Chemistry has put us in possession of the excreted wealth, which centuries had accumulated in the islands of the Pacific; and if the means which it has suggested for preventing the enormous waste of valuable matter perpetually and irrevocably swept away by the Thames and others of our large rivers, have not as yet been perfectly successful, it has enabled us to substitute for natural manure, artificial products, for the components of which the refuse of every trade and manufacture is now carefully sifted. Perhaps there is no more striking illustration of the value of the aid which agriculture has derived from her new ally, than the success which of late has attended the search for mineral manures. This search, directed by the philosophical interpretation of a few isolated facts, has been rewarded by the discovery of considerable quantities of phosphate of lime in various parts of England; thus realizing the prophetic

anticipation of Liebig, that "in the remains of an extinct animal world, England is to find the means of increasing her wealth in agricultural produce, as she has already found the great support of her manufacturing industry in fossil fuel, the preserved matter of primeval forests, the remains of a vegetal world."

Nor is the increase of his vegetal produce the only object in the pursuit of which the former relies upon the counsels of the chemist; in the feeding and fattening of his animal stock, he stands in no less need of his instruction.

And here we may briefly allude to the benefits, which *physiology*, *pathology*, and *medicine* in general, have derived, and must still further derive, from the prosecution of chemical inquiry. The investigation of the food of plants was followed by a no less vigorous scrutiny of the food of animals. The materials consumed by animals were shown to fulfil two distinct purposes in their economy, enabling us at once to separate into two distinct classes the substances supplying,—each respectively,—the aliments of nutrition, and those of respiration. In vegetal fibrin and albumen, we became acquainted with a group of nitrogenous compounds, which we find again in the animal organism as the chief constituents of the blood. These materials, prepared by vegetal life, the *herbivorous animal* receives and assimilates into its blood, to supply the constituents of its different organs and structures.

Again, we have a series of substances, such as fat, sugar, gum, starch, &c., which, though not truly to be called nutriments, as having no part in the construction of the body, are no less essential to the maintenance of life. These substances serve the process of respiration; combining with the oxygen inspired by the animal, they continually compensate the loss of temperature, and thus become the source of animal heat. And here presents itself one of the most interesting subjects for contemplation,—the animal organism in its relations to the surrounding atmosphere. The full appreciation of the effect of air and temperature on the animal system, was a most important step towards a true understanding of the conditions of health. A vast number of diseases originate in disturbances of the relation between the living system and these influences, the intimate knowledge of which affords to the physician the simplest, safest, and most efficient means of preserving health and of curing disease.

Valuable as have been the fruits of chemical inquiry, still more may be expected from the further prosecution of this study. The notion that the action of most of our medicines is chemical, is daily growing into a general conviction. We admit that with every change wrought by pharmaceutical agents in the state of our organism, there occurs a corresponding change in its composition, resulting from their reaction on one or more of its constituents. But of these transformations, which doubtless could be expressed in numbers as definitely as can our laboratory-processes, how few are we in a condition to explain; in how few instances has the physician even a vague conception of the mode in which any medicine performs its office! Nobody doubts the power, which the principles of the Cinchona bark, or of tea and coffee, exert upon the living body, but we are perfectly in the dark as to the way in which they act upon the animal economy. But if we meet with a series of similar substances in several animal fluids: *e.g.*, *urea* and *creatine*,

almost constantly present in urine, *glycocoll* generally, and *cystine*, occasionally, excreted in the same liquid, and if we find that all these substances exhibit in their chemical relations a close analogy with *quinine* and *theine*, we begin to feel a sort of anticipation of the manner in which these agents may act upon the system. Such examples illustrate at once the nature of the aid which therapeutics may confidently expect from the progress of organic chemistry. Medicine some years ago found itself in a predicament very similar to that of agriculture at the same period; its resources appeared to be in a state of exhaustion, the rich capital of *facts* accumulated in the department of organic morphology by the industry of the anatomist, and by the acumen of the physiologist, could not yield its full fruits until an equivalent of knowledge had been drawn from the study of biochemical phenomena. This state of things, however, is rapidly changing; associated with chemistry, medicine no longer draws the veil of vitality over processes, the mystery of which may be unlocked by the key of analysis; it no longer shrinks from climbing, step by step, the ladder of recognition, because its upper extremity, disappearing among the clouds, seems to rise for ever beyond the grasp of inquiry. The special zeal with which the field of organic chemistry has been cultivated during the last thirty years, the simple and accurate methods which we now possess for determining the composition of organic products, the amount of analysis actually performed, and more than all, the still untiring energy of the numerous labourers in the same field of investigation, hold out the promise that the connexion between medicine and chemistry, becoming daily more intimate, will be productive of benefits, the importance of which we can scarcely venture to estimate in the present state of our knowledge.

I have thus endeavoured to indicate some of the most remarkable features of the new field into which the present generation has been conducted by the study of natural science, and especially of chemistry. I have tried to sketch the prospects, which a continuation of these labours promises to open before us. It remains to me now to consider the cultivation of chemical science under its other equally important aspect, as the unfailing source of the purest and highest intellectual enjoyment, and as a means of mental training, more effectual perhaps than any other discipline.

If poetic antiquity endowed with a new soul him who learnt to speak the language of another people, how shall we find a fit term to express the sharpening of our perception, the enlargement of our views, the opening of a perfectly new sphere of vision, accruing from the acquisition of a language which unfolds to us the comprehension of nature? Phenomena so common that we are accustomed to pass them by almost with indifference, how are they changed,—I might say ennobled,—by the light that science has shed over them! True it is that the guiding hand which, according to immutable laws, rules over the economy of nature may be recognised without the aid of science. It is visible to everyone who, with an open eye, looks into the world; but no one familiar with the mutual relations by which nature's phenomena are linked together, could deny that with each step forward in the field of research, the conviction becomes more deeply rooted, and that each new observation discloses a new source of the most elevated contemplations.

When glancing, in a former portion of this lecture, at the benefits arising to agriculture and medicine from the progress of chemistry, I have already hinted at the inquiries which have for their object the examination of the chemical conditions of vegetal and animal life, and at the light which they have thrown upon the true nature of respiration and nutrition. I am inclined to look again at these inquiries from a different point of view. They have taught us that animal respiration is a true process of combustion; in order to secure the necessary warmth, we have to burn at every moment a part of our body; this source of heat lasts so long as we supply to the seat of combustion continually renewed fuel; so long as the alternation of breathing maintains the supply of the necessary amount of oxygen, and accomplishes the removal of the products of combustion, *i.e.*, of water and carbonic acid. With each respiration the animal robs the atmosphere of a certain quantity of oxygen, and introduces into it a proportionate bulk of carbonic acid. If we consider that the endless processes of combustion, carried out for domestic purposes and for the purposes of industry, produce the same effect; that, lastly, the transformations of organic matter, which we designate as putrefaction and decay, are, in many respects, nothing but processes of slow combustion: it is evident that the unlimited continuance of these conditions must gradually involve a change in the constitution of our atmosphere. Such a change has not yet been observed. It has been justly argued that the immense space of the atmosphere necessarily renders changes of this sort extremely slow, that our analytical methods are not sufficiently accurate, that our experiments do not extend over a sufficient length of time; nevertheless, who could fail to perceive that the compensation is furnished by the difference of conditions which govern the life of the plant in contradistinction to that of the animal? With its leaves, as with so many lungs, the plant withdraws the carbonic acid from the air. Under the influence of sunlight the carbonic acid splits into its constituents—the carbon is employed in building up the plant, whilst the oxygen is returned into the atmosphere. The plant is referred, for its support, to the compound which the animal ejects from its organism as no longer serviceable for the purposes of its life; but it requires only a part of this compound; the rest is set free, again to take part in the development of a new animal generation.

How simple and how wonderful are the means which nature employs to fulfil her least, as well as her greatest designs!

A mine of interesting considerations is opened by the phenomena to which we have slightly adverted. The carbon of the plant is derived from the air, in which it exists in the form of carbonic acid. The carbonic acid is, as we have seen, partly furnished by the respiration of the animal; but in combustion as in decay a supply of carbonic acid no less inexhaustible is secured to the atmosphere. But with how new a signification do these processes become endowed when we view them in relation to vegetal life! Combustion, which suggests to the ordinary observer the idea of destruction—decay, which we are in the habit of considering as the symbol of death, in the eye of the chemist are but changes of form bearing the germ of a new unfolding of life. Of all the changes which surround us in nature how different are the views we take, when once the study of

chemical phenomena has convinced us of the indestructibility of matter, when once we have accustomed ourselves to consider, as fixed and unalterable, the sum of matter which, under the influence of the forces of nature in the processes of vegetal and animal life, is capable of assuming so endless a variety of form!

Contemplations of even a higher order have been attached to this recognition. No one is likely to deny the danger of attempting to refer the conditions of spiritual life to the laws of the material world, still, this speculation, which appears so consonant to ordinary conception, has been at all times indulged in. If in the gradual development of the cell, of the organ, of the animal,—each phase of which, although fulfilling a definite purpose of the present, nevertheless points to a future end as yet unfulfilled,—physiologists have seen but a special case of a much more general law, which governs likewise the unfolding and ultimate destiny of the human mind;—can we wonder that in the indestructibility of matter (the medium in which all these transformations are accomplished without a particle of it being lost),—chemical philosophers should with delight have imagined they had found a measure applicable to spiritual life, and that indestructibility of matter thus became to them a symbol of the immortality of the soul?

Thus we see emanating from the results of chemical inquiry a rich vein of considerations such as must be acceptable to every thinking mind; but these considerations are by no means limited to objects of general interest. No department of knowledge,—no branch of study,—can be imagined, but what might draw from the stores of chemical experience important solutions and significant suggestions. We find abundant proofs of this assertion in the chemico-agricultural, and chemico-physiological inquiries of Liebig, the general results of which are embodied in his admirable "Familiar Letters on Chemistry." The merchant, the political economist, the statesman, the ethnographer, the historian, each of them finds in this book numerous questions, in which he takes a lively interest, elucidated from the chemical point of view. Let us select a few examples from the superabundant material teeming on every page of Liebig's letters.

The *ethnographer* makes us intimately acquainted with the manners and customs of different nations, but how seldom does he go a step farther and attempt to explain such manners and customs (which are certainly not accidental) by referring them to the physical conditions of life of the respective nations, to the geographical situation, or the climate of the countries which they inhabit! We obtain the most circumstantial accounts of the dietetics of different races, we learn with a sort of discomfort the small portions of, as we should think, unsubstantial nourishment which satisfy the inhabitant of a tropical country, while we lay aside with disgust the bill of fair of the Esquimaux, informing us of the quantity of blubber which constitutes the chief ingredient of his meal. How clearly has Liebig proved the natural necessity for this difference in the choice and quantity of food, by showing that it depends on the quantity of carbon, the combustion of which, under given circumstances, is required for the preservation of sufficient warmth! We have as little reason to admire the South for its moderation as to reproach the North for its extraordinary appetite. Every one who has lived some time in a tropical climate recollects how his appetite diminished; whilst our Arctic travellers, as we see by their journals, become quickly reconciled to polar diet. It is well known, moreover, that the beasts of prey of the Arctic regions considerably exceed in voracity the animals of the torrid zones.

If the *historian* inquires into the causes of the decline and gradual disappearance of the North American Indians, he is led to the perfectly correct conclusion, that a combination of circumstances must be involved in producing so striking a result. In any case he will learn with great interest the chemical conditions which are contributing to this catastrophe. Viewed in the light of chemico-physiological experience, the extinction of the red population must be ascribed to the animal food on which the Indian, as hunter, has especially to rely. The same experience has, in fact, taught us that a given surface of land, when serving the purpose of agriculture, is capable of supporting a number of persons from 80 to 90 times greater than when covered by forests inhabited by a nation of hunters. "Thus we see a scanty tribe of Indians dispersed over immense tracts of hunting ground, which must be considerably extended with the slightest increase of their number; and thus we understand the endless warfare which is decimating those red sons of the wilderness. It is no contest of principles, as with a civilized people, which, sparing the conquered, grants to him an honourable peace, but a mutual war of extermination—the desperate struggle for the morsel of bloody flesh which, like the beast of his forests, the Huron tears with his teeth!" (Schödler.*)

It would be easy to multiply examples of the same kind, but I would rather allude, in conclusion, to the importance of the study of chemistry, as a means of education apart from the advantages (accruing from the acquisition of such a vast variety of positive knowledge), which I have endeavoured to point out in the earlier parts of this lecture.

No one doubts the influence which mathematical pursuits have in developing the mental powers. No one can deny that the precision of thought, the correct inference from given premises, essential to progress in mathematics, gradually becomes a habit, which is soon transferred to intellectual labour of any other kind. The mathematician starts from certain fundamental truths, which, without external aid, he is capable of elaborating out of his own mind; and on this basis he piles up, step by step, the wonderful edifice of his science. It is this nature-like mode of construction, disdaining to raise another stone before the previous one is thoroughly secured, which constitutes the value of mathematics, as an element of mental training.

The pursuits of chemical studies involves no less the development of the mental power; it leads no less to precision of thought; it improves no less the habit of drawing correct conclusions, which, once acquired, is as easily transferred to other fields of mental labour. Chemistry, as a science, differs essentially from mathematics in this one respect,—that the truths which are its foundation cannot be drawn from the human mind itself. These truths are external to our mind, and can only be obtained by careful observation of the outer world; but, once our mental property, these experience-

* Discourse on the Study of Chemistry as a means of Education.

gathered truths afford a foundation equally adapted for the natural, like unfolding of a system of conclusions, which are not less logically linked together than the conclusions of the mathematician. The chemist has, however, this advantage over the latter:—whereas the mathematician has to find the guidance of his steps within himself, the chemist possesses in nature a mirror which, duly questioned, at every moment readily informs him whether he is still advancing in the right direction.

ON THE VERSIFICATION OF PARADISE LOST.

ADDISON, though he has considered this poem under most of the general topics of criticism, has barely touched upon the versification; not probably because he thought the art of numbers unworthy of his notice, for he knew with how minute attention the ancient critics considered the disposition of syllables, and had himself given hopes of some metrical observations upon the great *Roman* poet; but being the first who undertook to display the beauties, and point out the defects, of *Milton*, he had many objects at once before him, and passed willingly over those which were most barren, of ideas, and required labour rather than genius.

Yet versification, or the art of modulating his numbers, is indispensably necessary to a poet. Every other power by which the understanding is enlightened or the imagination enchanted, may be exercised in prose. But the poet has this particular superiority, that to all the powers which the perfection of every other composition can require, he adds the faculty of joining music with reason, and of acting at once upon the senses and the passions. I suppose there are few who do not feel themselves touched by poetical melody, and who will not confess that they are more or less moved by the same thoughts, as they are conveyed by different sounds, and more affected by the same words in one order than another. The perception of harmony is indeed conferred upon men in degrees very unequal, but there are none who do not perceive it, or to whom a regular series of proportionate sounds cannot give delight.

In treating on the versification of *Milton*, I am desirous to be generally understood, and shall, therefore studiously decline the dialect of grammarians; though, indeed, it is always difficult, and sometimes scarcely possible, to deliver the precepts of an art, without the terms, by which the peculiar ideas of that art are expressed, and which had not been invented, but because the language already in use was insufficient. If, therefore, I shall sometimes seem obscure, it may be imputed to this voluntary interdiction, and to a desire of avoiding that offence which is always given by unusual words.

The heroic measure of the *English* language may be properly considered as pure or mixed. It is pure when the accent rests upon every second syllable through the whole line.

> Courage uncertain dangers may abate,
> But who can bear th' approach of certain fate.
> *Dryden.*
>
> Here love his golden shafts employs, here lights
> His constant lamp, and waves his purple wings.
> Reigns here, and revels: not in the bought smile
> Of harlots, loveless, joyless, unendear'd.
> *Milton.*

accent may be observed in the second line of *Dryden*, and the fourth in *Milton*, to repose upon every second syllable. This position of this sound or percussion at equal times, is the most complete harmony of which a single verse is capable, and should therefore be exactly kept in distichs, and generally in the last line of a paragraph, that the ear may rest without any sense of imperfection.

But to preserve the series of sounds untransposed in a long composition, is not only very difficult, but tiresome and disgusting; for we are soon wearied with the perpetual recurrence of the same cadence. Necessity has therefore enforced the mixed measure, in which some variation of the accents is allowed; this, though it always injures the harmony of the line considered by itself, yet compensates the loss by relieving us from the continual tyranny of the same sound, and makes us more sensible of the harmony of the pure measure.

Of these mixed numbers, every poet affords us innumerable instances, and *Milton* seldom has two pure lines together, as will appear if any of his paragraphs be read with attention merely to the music,

> Thus at their shady lodge arriv'd, both stood,
> Both twin'd, and under open sky ador'd
> The God that made both sky, air, earth, and heav'n,
> Which they beheld; the moon's resplendent globe
> *And starry pole: thou also mad'st the night,*
> Maker Omnipotent! and thou the day,
> Which we in our appointed work employ'd
> Have finish'd, happy in our mutual help,
> *And mutual love, the crown of all our bliss,*
> Ordain'd by thee; and this delicious place,
> For us too large; where thy abundance wants
> Partakers, and uncropp'd falls to the ground;
> But thou hast promis'd from us two a race
> To fill the earth, who shall with us extol
> Thy goodness infinite, both when we wake,
> And when we seek, as now, thy gift of sleep.

In this passage it will be at first observed, that all the lines are not equally harmonious, and upon a nearer examination it will be found that only the fifth and ninth lines are regular, and the rest are more or less licentious with respect to the accent. In some the accent is equally upon two syllables together, and in both strong. As,

> Thus at their shady lodge arriv'd, *both stood,*
> *Both twin'd* and under open sky ador'd,
> The God that made both *sky, air, earth,* and heav'n.

In others the accent is equally upon two syllables, but upon both weak:

> To fill the earth, who shall with us extol
> Thy goodness infinite, both when we wake,
> *And when* we seek, as now, thy gift of sleep.

In the first pair of syllables the accent may deviate from the rigour

of exactness, with any unpleasing diminution of harmony, as may be observed in the lines already cited, and more remarkably in this,

——— Thou also mad'st the night,
Maker Omnipotent! and thou the day.

But, excepting in the first pair of syllables, which may be considered as arbitrary, a poet who, not having the invention or knowledge of *Milton*, has more need to allure his audience by musical cadences, should seldom suffer more than one aberration from the rule in any single verse.

There are two lines in this passage more remarkably unharmonious;

——— This delicious place,
For us too large; *where thy* abundance wants
Partakers, and uncropp'd *falls to* the ground

Here the third pair of syllables in the first and fourth pair in the second verse, have their accents retrograde or inverted; the first syllable being strong or acute, and the second weak. The detriment which the measure suffers by this inversion of the accents is sometimes less perceptible, when the verses are carried one into another, but is remarkably striking in this place, where the vicious verse concludes a period; and is yet more offensive in rhyme, when we regularly attend to the flow of every single line.

That verse may be melodious and pleasing, it is necessary, not only that the words be so ranged as that the accent may fall on its proper place, but that the syllables themselves be so chosen as to flow smoothly into one another. This is to be effected by a proportionate mixture of vowels and consonants, and by tempering the mute consonants with liquids and semivowels. The Hebrew grammarians have observed, that it is impossible to pronounce two consonants without the intervention of a vowel, or without some emission of the breath between one and the other: this is longer and more perceptible, as the sounds of the consonants are less harmonically conjoined, and, by consequence, the flow of the verse is longer interrupted.

It is pronounced by *Dryden*, that a line of monosyllables is almost always harsh. This, with regard to our language, is evidently true, not because monosyllables cannot compose harmony, but because our monosyllables being of Teutonic original, or formed by contraction, commonly begin and end with consonants, as,

——— Every lower faculty
Of sense, whereby they hear, see, smell, touch, taste.

The difference of harmony arising principally from the collocation of vowels and consonants, will be sufficiently conceived by attending to the following passages:

Immortal *Amarant*—there grows
And flow'rs aloft, shading the fount of life,
And where the river of bliss, through midst of heav'n
Rolls o'er Elysian flow'rs her amber stream;
With these that never fade, the spirits elect
Bind their resplendent locks inwreath'd with beams.

The same comparison that I propose to be made between the fourth

and sixth verses of this passage, may be repeated between the last lines of the following quotations:

Under foot the violet,
Crocus, and hyacinth, with rich in-lay,
Broider'd the ground, more colour'd than with stone
Of costliest emblem.
Here in close recess,
With flow'rs, garlands, and sweet-smelling herbs,
Espoused Eve first deck'd her nuptial bed;
And heav'nly choirs, the hymenean sung.

Milton, whose ear had been accustomed not only to the music of the ancient tongues, which, however vitiated by our pronunciation, excel all that are now in use, but to the softness of the *Italian*, the most mellifluous of all modern poetry, seems fully convinced of the unfitness of our language for smooth versification, and is, therefore, pleased with an opportunity of calling in a softer word to his assistance; for this reason, and I believe for this only, he sometimes indulges himself in a long series of proper names, and introduces them where they add little but music to his poem.

——— The richer seat
Of *Atabalipa*, and yet unspoil'd
Guiana whose great city Gerion's sons
Call El Dorado.———
The moon——The Tuscan artist views
At evening, from the top of Fesole,
Or in Valdarno, to descry new lands.

He has, indeed, been more attentive to his syllables than to his accents, and does not often offend by collisions of consonants, or openings of vowels upon each other, at least not more often than other writers who have had less important or complicated subjects to take off their care from the cadence of their lines.

The great peculiarity of *Milton's* versification, compared with that of later poets, is the elision of one vowel before another, or the suppression of the last syllable of a word ending with a vowel, when a vowel begins the following words—As,

Knowledge———
Oppresses else with surfeit, and soon turns
Wisdom to *folly* as nourishment to wind.

This licence, though now disused in *English* poetry, was practised by our old writers, and is allowed in many other languages ancient and modern, and, therefore, the critics on Paradise Lost have, without much deliberation, commended *Milton* for continuing it. But one language cannot communicate its rules to another. We have already tried and rejected the hexameter of the ancients, the double close of the *Italians*, and the Alexandrine of the *French*; and the elisions of vowels, however graceful it may seem to other nations, may be very unsuitable to the genius of the *English* tongue.

There is reason to believe, that we have negligently lost part of our vowels, and that the silent *e* which our ancestors added to most of our monosyllables, was once vocal. By this detruncation of our syllables, our language is overstocked with consonants, and it is more necessary to add vowels to the beginning of words, than to cut them off from the end.

Milton, therefore, seems to have somewhat mistaken the nature of our language, of which the chief defect is ruggedness and asperity, and has left our harsh cadence yet harsher. But his elisions are not all equally to be censured; in some syllables they may be allowed, and perhaps in a few may be safely imitated. The abscission of a vowel is undoubtedly vicious when it is strongly sounded, and makes, with its associate consonant, a full and audible syllable.

——— What he gives,
Spiritual, may to purest spirits be found,
No ingrateful food, and food alike these pure
Intelligential substances require.
Fruits——*Hesperian* fables true,
If true, *here only*, and of delicious taste.
——— Evening now approach'd,
For we have *also* our evening and our morn.
Of guests he makes them slaves,
Inhospitably, and kills their infant males.
And vital *virtue* infus'd, and vital warmth
Throughout the fluid mass.———
God made *thee* of choice his own, and of his own
To serve him.

I believe every reader will agree, that, in all those passages, though not equally in all, the music is injured, and in some the meaning obscured. There are other lines in which the vowel is cut off, but it is so faintly pronounced in common speech, that the loss of it in poetry is scarcely perceived; and therefore, such compliance with the measure may be allowed.

Nature breeds
Perverse, all monstrous, all prodigious things,
Abominable, inutterable, and worse
Than fables yet have feign'd———
——— From the *shore*
They view'd the vast immeasurable abyss.
Impenetrable, impal'd with circling fire.
To none communicable in earth or heav'n.

Yet even these contractions increase the roughness of a language too rough already; and though in long poems they may be sometimes suffered, it never can be faulty to forbear them.

Milton frequently uses in his poems the hypermetrical or redundant line of eleven syllables.

——— Thus it shall befall
Him who to worth in woman over-trusting
Lets her will rule ———
I also err'd *in* over-much admiring.

Verses of this kind occur almost in every page; but though they are not unpleasing a dissonant, they ought not to be admitted into heroic poetry, since the narrow limits of our language allow us no other distinction of epic and tragic measures than is afforded by the liberty of changing at will the terminations of the dramatic lines, and bringing them by the relaxation of metrical rigour nearer to prose.

Milton formed his scheme of versification by the poets of *Greece*

d *Rome*, whom he proposed to himself for his models so far as a difference of his language from theirs would permit the imita-n. There are indeed, many inconveniencies inseparable from our roic measure, compared with that of *Homer* and *Virgil*; incon-iencies, which it is no reproach to *Milton*, not to have overcome, use they are in their own nature insuperable; but against h he has struggled with so much art and diligence, that he at least be said to have deserved success.

ne hexameter of the ancients may be considered as consisting of en syllables, so melodiously disposed, that, as every one knows has examined the poetical authors, very pleasing and sonorous yric measures are formed from the fragments of the heroic. indeed, scarce possible to break them in such a manner, but *iacenias etiam disjecti membra poeta*, some harmony will still in, and the due proportions of sound will always be discovered. measure, therefore, allowed great variety of pauses, and great ties of connecting one verse with another because, wherever line was interrupted, either part singly was musical. But the nts seem to have confined this privilege to hexameters; for, in other measures, though longer than the *English* heroic, those wrote after the refinements of versification, venture so seldom ange their pauses, that every variation may be supposed rather npliance with necessity than the choice of judgment.

lton was constrained within the narrow limits of a measure not harmonious in the utmost perfection; the single parts, there-into which it was to be sometimes broken by pauses, were in r of losing the very form of verse. This has, perhaps, not-tanding all his care, sometimes happened.

harmony is the end of poetical measures, no part of a verse t to be so separated from the rest as not to remain still more onious than prose, or to show, by the disposition of the tones, t is part of a verse. This rule in the old hexameter might be observed, but in *English* will very frequently be in danger of ou; for the order and regularity of accents cannot well be ved in a succession of fewer than three syllables, which will the *English* post to only five pauses; it being supposed, hen he connects one line with another, he should never make pause at less distance than that of three syllables from the or end of a verse.

his rule should be universally and indispensably established, ps cannot be granted; something may be allowed to variety, nd something to the adaptation of the numbers to the subject; ut it will be found generally necessary and the ear will seldom fail o suffer by its neglect.

Thus when a single syllable is cut off from the rest, it must either e united to the line with which the sense connects it, or be sounded long. If it be united to the other line, it corrupts its harmony; if ejoined it must stand alone, and, with regard to music, be super-ous; for there is no harmony in a single sound, because it has no portion to another.

Hypocrites austerely talk,
Defaming as impure what God declares
Pure; and commands to some, leaves free to all.

When two syllables likewise as absconded from the res
evidently want same associate sounds to make them harmonio

——— Eyes ———
——— More wakeful than to drowze,
Charm'd with Arcadian pipe, the past'ral reed
Of Hermes, or his opiate rod. *Meanwhile*
To re-salute the world with sacred light
Leucothea wak'd,
He ended, and the sun gave signal high
To the bright minister that watch'd : *he blew*
His trumpet.
First in the east his glorious lamp was seen,
Regent of day : and all th' horizon round
Invested with bright rays, jocund to run
His longitude through heav'ns high road ; *the gray*
Dawn, and the Pleiades, before him danc'd,
Shedding sweet influence.

The same defect is perceived in the following line, where the
is at the second syllable from the beginning.

The race
Of that wild rout that tore the *Thracian* bard
In Rhodope, where woods and rocks had ears
To rapture, 'till the savage clamour drown'd
Both harp and voice ; nor could the muse defend
Her son. So fail not thou, who thee implores.

When the pause falls upon the third syllable or the seventh
harmony is better preserved ; but as the third and seventh are
syllables, the period leaves the ear unsatisfied, and in expectati
the remaining part of the verse.

He with his horrid crew,
Lay vanquished, rolling in the fiery gulph,
Confounded, though *immortal*. But his doom
Reserv'd him to more wrath ; for now the thought
Both of lost happiness and lasting pain
Torments *him*.
God, ——— with frequent interconrse,
Thither will send his winged *messengers*
On errands of supernal grace. So sung
The glorious train ascending.

It may be, I think, established as a rule, that a pause w
cludes a period should be made for the most part upon a
syllable, as the fourth and sixth ; but those pauses which only
pend the sense may be placed upon the weaker. Thus the re
the third line of first passage satisfies the ear better than in
fourth, and the close of the second quotation better than of the t

The evil soon
Drawn back, redounded (as a flood) on those
From whom it *sprung* ; impossible to mix
With *blessedness*.

——— What we by day
Lop overgrown, or prune, or prop, or bind,
One night or two with wanton growth derides,
Tending to *wild*.

The paths and bowers doubt not but our joint hands
Will keep from wilderness with ease as wide
As we need walk, till younger hand ere long
Assist us.

because rest, in the fifth place, has the same inconvenience as in the
which with third ; that the syllable is weak.

Beast now with beast 'gan war, and fowl with fowl,
And *fish* with fish, to graze the herb, all leaving,
Devour'd each *other* : Nor stood much in awe
Of man, but fled *him*, or with countenance grim,
Glar'd on him *passing*.

It is the noblest and most majestic pauses which our versification
that its, are upon the fourth and sixth syllables, which are both
remarkably sounded in a pure and regular verse, and at either of which
This line is so divided, that both members participate of harmony.

But now at last the sacred influence
Of light *appears*, and from the walls of heav'n
Shoots far into the bosom of dim night
A glimmering dawn ; here nature *first* begins
Her farthest verge, and chaos to retire.

a cont far above all others, if I can give any credit to my own ear
Mie rest upon the sixth syllable, which taking in a complete
very ass of sound, such as is sufficient to constitute one of our
fore, measures, makes a full and solemn close. Some passages
daugo conclude at this stop. I could never read without some
withsms of delight or admiration.

As
Before the hills appear'd, or fountain flow'd,
ough
Thou with the eternal wisdom didst converse,
larm
Wisdom thy sister ; and with her didst play
that
In presence of the Almighty Father, pleas'd
easily
With thy celestial *song*.
violati
perceiv
Or other worlds they seem'd, or happy isles,
confine
Like those *Hesperian* gardens fam'd of old,
that, w
Fortunate fields, and groves, and flow'ry vales,
a full
Thrice happy isles ! But who dwelt happy there,
beginnin
He staid not to *inquire*.
Than t
perhar
He blew
His trumpet, heard in *Oreb since*, perhaps
When God descended ; and, perhaps, once more
ar
To sound at general *doom*.

If the poetry of *Milton* be examined, with regard to the pauses,
and flow of his verses into each other, it will appear, that he has
performed all that our language would admit ; and the comparison
of his numbers with those who have cultivated the same manner of
writing, will show that he excelled as much in the lower as the
diner parts of his art, and that his skill in harmony was not less
flu
pro
his invention or his learning.

Dr. JOHNSON.

INDIAN FAIRY TALES.*

In more respects than one this is a very remarkable and interesting little book. Without any knowledge of the circumstances under which it was produced, any one at all familiar with the subject would perceive almost at a glance that he had before him a genuine and unsophisticated contribution to the literature of what is now generally known as folk lore. This alone would suffice as an attraction to a good many readers; but a still greater interest attaches to it from the manner in which it came into existence. The collector and translator, a young lady not far advanced in her teens, and eldest daughter of the distinguished Celtic scholar, Mr. Whitley Stokes, of the Indian Council, has for the last two or three years devoted herself to taking down such fairy tales as she could extract from the servants of the family and putting them into simple but excellent and scrupulously faithful English; and, her gatherings having reached the goodly number of thirty, we have them here in the form of the present attractive-looking volume. But the story of the book will be best told in her own words. "The first twenty-five stories in this book were told to me at Calcutta and Simla by two ayahs, Dunkní and Múniyà, and by Karím, a Khidmatgar. The last five were told to my mother by Múniyà. At first the servants would only tell their stories to me because I was a child and would not laugh at them; but afterwards the ayahs lost their shyness and told almost all their stories over again to mother when they were passing through the press. Karím would never tell his to her or before her. The stories were all told in Hindústání, which is the only language that these servants know." After having been put into English they were read back to the tellers in Hindústání, most of them more than once; nor till each tale was pronounced to be tik (exact) was it sent to the press; and the ayahs, we are assured, showed the greatest anxiety to have their tales reproduced exactly as they told them. It will be seen, therefore, that the present volume, in origin, substance, and composition, bears a strong resemblance to a very delightful and deservedly popular book—Miss Frere's "Old Deccan Days." But there is one important difference. The narrator of the stories given by Miss Frere, though a native of India, was a Christian, as her father and grandfather had been; while in this case the two ayahs from whom all except two of the tales are derived are Hindús, and therefore much more likely to be thoroughly *en rapport* with the spirit of their stories than any Christian could be, a fact which cannot be without its bearing on their value as faithful representatives of the native traditional fancy.

There are two very distinct points of view from which tales of this sort may be looked at. There is what may be called the sensual point of view, from which they are regarded merely as entertaining stories, and valued solely for their interest, poetical beauty, drollery, humour, or quaintness; and they have also their scientific aspect as materials for comparative mythology, as illustrations of the manner in which the process of evolution operates on the products of the

* "Indian Fairy Tales." Collected and translated by Maive Stokes. With Notes by Mary Stokes, and an Introduction by W. R. S. Ralston, M.A. (London: Ellis and White, 1880.)

imagination, as specimens throwing more or less light on the invention and fancy of what we may call the *stone-age of fiction*. Of course, it stands to reason that from two so widely differing points of view there must be a corresponding difference as to what constitutes the merits of a story—a difference, indeed, almost amounting to antagonism; for the qualities which attract the general reader are the very ones which find least favour with the comparative mythologist. Baldness, pointlessness, silliness, or utter absurdity are far from being blemishes in his eyes. On the contrary, he looks with suspicion on any semblance of artistic construction or design, and regards anything in the way of a purpose or moral with the repugnance which a genuine old-china maniac feels for perspective, correct drawing, and elegance of form. Even a venerable cosmopolitan tale like Cinderella is not accepted by him without some degree of distrust, as having about it certain indications of the manipulation of the literary craftsman, and at best a doubtful pedigree as a true piece of popular traditional fancy-work. As might be expected from the account given of the origin of this collection, the tales in it show few traces of having been shaped or tampered with to satisfy the artistic instincts of successive story-tellers. They come to us, there can be very little doubt, as nearly as possible unchanged from the form in which they have been transmitted by one generation to another from the remote past; and we may be pretty sure that the same conservative spirit that made the ayahs so anxious to have them reproduced exactly as they had been told has always governed their transmission. Instances, of course, there are where the necessities of storytelling have led to the introduction of new ideas; as in the case of the Raja's son, who takes his gun with him as well as his bow and arrows, when he goes a hunting; and in a century or two hence, perhaps, the Prince of an Indian fairy tale will go to woo his bride by railway. Modern interpolations of this kind are always apt to creep into tales preserved by oral repetition. There are very few, however, in these tales, which, for all we can see, may not have been told a thousand years ago much as we have them now. The invention is of the bold archaic stamp, very different from the half-hearted timidity and weak subservience to probability which restrain the imaginations of modern dealers in the marvellous. The old Oriental romancer stopped at nothing. Here in the "Wonderful Story," as it is very justly called, we find a casual kite (of which Sindbad's roc was clearly a *degenerate descendant*) flying away with a bundle containing three or four thousand camels, which it afterwards drops into the eye of a princess. It did not hurt her much, her eye was so large, the story adds; but this is probably a gloss by some comparatively modern narrator with a slight leaning towards rationalism. It may be observed that there is no idea of proportion in these tales. The inventors are never troubled by scruples like those of the conscientious toymaker in "The Cricket on the Hearth," that "flies, you know, ain't on that scale compared with an elephant." As on the willow-pattern plate that Charles Lamb loved, animals are "co-extensive:" there is no question of relative bulk or physical power between a camel and a mouse; for legendary purposes the one is as the other. Thus in one tale we have a mouse that makes nothing of carrying a load of sugar-canes, tying herdsmen to a post

and carrying off their cattle, forcibly abducting a Raja's daughter, and similar feats; and the voracious frog, in the tale of that title, swallows a rat, a baker, a lemon-dealer, and a horse and groom, after which he expresses a wish to be shaved. The barber is apparently a kind of Nemesis, for "he thought the frog looked very fat, and as he was shaving him, he suddenly made a cut in his stomach, and the rat, baker, lemon-seller, and horse and groom jumped out, and the frog died." Perhaps the boldest and most thoroughly Oriental touch in this is the shaving of the frog. It is only an entirely unfettered fancy that would have ventured to connect the idea of shaving with, of all creature in animated nature, a frog. It must not be supposed that this undisciplined kind of imagination is the prevailing characteristic of all the tales Miss Stokes has collected. They are by no means of any one type. The ninth, for instance, "The Bulbul and the Cotton-tree," is a didactic tale, distinctly of the fable family. Then, the story of "Foolish Sachúli" is one of a class common in all countries, turning on the adventures and mishaps of a half-witted hero, whose half-wit, helped by luck, stands him in good stead at last. In Sachuli, by the way, we have a kind of reflection of Ahaschar. He indulges in the same sort of vision, and while carrying on his head a jar of ghee, for which he is to be paid four pice, the train of thought leads up to an imaginary proposition at which he shakes his head. There is no story in the collection that is not curious as an illustration of Indian thought, and many of them are very charming as stories pure and simple. A particularly graceful one is the "Fan Prince," so called because of the magic fan he presented to his lady-love, by means of which she was always able to call him to her side, no matter how far off he might be; and very pretty are the stories of "Loving Laili" and of "The Princess who Loved her Father like Salt," and two or three others of the same stamp.

As might be expected, here and there throughout the book there are to be found instances of parallelism between Indian and European tales. In the "Wonderful Story," for instance, a wrestler who has heard of the vast strength of another wrestler visits him in order to try a fall with him, but is received by his daughter and frightened by the prodigious muscular power of which she gives evidence. This is very like the Irish legend, according to which a Scotch giant crossed over to Ireland (it was when the great Causeway was a thoroughfare) on a similar mission, but was discomfited by his rival's wife, who put her husband in the cradle and passed him off as his own infant son, contriving at the same time to let him give such proofs of vigour as made the stranger think that the father of such a babe was a person to be avoided rather than sought. Mr. W. R. S. Ralston deals with this feature of the collection in a most interesting and valuable introduction, showing the relation between many of the tales and popular stories current in various parts of Europe. In his opinion—and it is needless to say there is no higher authority on the subject—a collection like this, of genuine Indian fairy tales, faithfully representing native thought is of real value to the specialist who devotes himself to the comparison of folk-tales. Readers of popular tales must have been often struck by the fact that the machinery and the leading ideas are of a kind for which it is very difficult to see any possible origin

he traditions or beliefs of the people from whom they come. as Mr. Ralston says, "when we find stories now current in all s of India, which we know from their occurrence in Sanskrit ature must have existed there very long ago, and we see that mythological element in these stories is in accordance with a ious ideas that have prevailed there for countless centuries we have no doubt that these stories were framed there at a very period. Then if we find almost identical stories current in arts of Europe, many of their at least apparently mythological ures offering difficulties which cannot be removed by a reference e mythologies of the heathen ancestors of the peasants who repeat them, it seems not unreasonable to come to the conclu that such stories have been borrowed by the West from the ." We must, in fact, either adopt the exceedingly improbable rnative of a completely independent development, or else admit heory that, as Mr. Ralston happily puts it, "the wave of story- g, as well as of empire, has wended its way westward." Hence alue of a collection like this, made at first hand in the cradle- f story-telling. Its value to those who take an interest in bject is still further increased by a very full bibliography of d books, and by an appendix of notes, the work of the late Whitley Stokes, which not only gives evidence of a remark- ide range of reading, but shows a highly cultivated literary Thus, what with the tales which form the body of the book e adjuncts in the shape of introduction and notes, the volume which will be indispensable to all who collect or take an st in the literature of folk-lore; and it may be safely predicted n the shelves of this class of reader at least it will have an rable asylum long after many of its contemporaries have t away into the nirvana that awaits "books of the season."—*Fall Budget.*

—In the French Academy the other day, M. Hirn called atten- o a curious care he had observed of heating of a bar of iron. ar (about 1m. long and 0·08m. diameter) was being held by a nan on another piece, while a second workman hammered its nd. At each stroke the workman holding the bar found that dently became greatly heated, then suddenly cooled. M. Hirn, ding the bar, had a like experience, and, to his great surprise, dden variation of temperature seemed to him nearly thirty- grees. He was surprised because a calculation of the work lid not seem to give anything like such a heating effect. The menon is best observed when the bar is seized very near the nd. M. Hirn considered the effect in question to be of a wholly tive character—*i.e.*, one of sensation. The source of heat, l, on careful observation, seemed to reside in the interior of and, not at the surface of the metal. He thinks sonorous ions may, in certain circumstances cause, at the periphery of dy, a sensation of heat, just as a blow on the eye or pressure may awaken the sensation of light. He suggests, however, to the experiment of examining the state of the bar (when struck) ans of a Melloni thermometer.

APPOINTMENTS.

Appointments made by the Director of Public Instruction, between 16th June and 15th July 1880.

K. Ramanujah Charlu, B.A., 6th Assistant, Combaconum College as 4th Assistant during the absence of N. Ragunatha Charry on oth

R. Sivarama Iyer, 4th Assistant, Combaconum College, to act Assistant.

V. Ramachendriar, B.A., Headmaster, Middle School, Tiruvarur as 7th Assistant, Combaconum College.

S. A. Sundaram Iyer, 8th Assistant, to be 5th Assistant *substantive*

R. Chakravarthy Iyengar, Headmaster, Middle School, Trivad 8th Assistant, *substantive pro tem.*

Mahomed Azum, B.A., to be Deputy Inspector of Mahomedan S *substantive pro tem.* vice Mahomed Ruzzu, appointed as an Attach Resident of Hyderabad.

P. Chakko, B.A., to be 2nd Master, *substantive pro tem*, Cannano School, on Rs. 50.

Mr. M. Kenny, Headmaster, Berhampore College, to be Hea Kurnool High School, and to act as First Assistant Master, Civil E ing College, during the absence of Mr. James Bradshaw, on other

Mr. Scorgie, Headmaster, Cuddalore College, and 1st Assistant *su pro tem*, Rajahmundry College, to be Headmaster, Berhampore without prejudice to his *substantive pro tem*, appointment.

Mr. T. R. Scott, Headmaster, *substantive pro tem*, Cuddalore C be Headmaster *substantive pro tem*, Berhampore College.

Mr. E. H. Elliot, Headmaster, High School, Kurnool, to be Hea Cuddalore College.

Mr. C. H. Thumbu Pillay, 2nd Master, Madura College, to act master, High School, Kurnool.

S. Subramania Iyer, 3rd Master, Madura College, to act as 2n Kurnool.

T. Subramania Iyer, B.A., to act as 3rd Master, Kurnool.

C. Venkatramiah, 3rd Master, Wallajapet, Middle School, to a Master, Kurnool, during the absence of Venkata Kristna Iyengar,

S. V. Malagiri Row, confirmed in the appointment of 3rd Master, High School, Kurnool.

V. Ramachendriah, Headmaster, Middle School, Tiruvarur an 7th Assistant, Combaconum College, to act as 1st Assistant, Co lege, *vice* Vaithinatha Iyer, on leave.

R. Doraisawmy Iyer, Assistant Master, Cuddalore College, to Assistant, Combaconum College, *vice* Ramachendriah.

H. B. GRIG
Director of Public In

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