

THE INDIAN

UNIVERSITY OF RESEARCH.

PREFACE.

The Scheme unfolded in these pages did not assume its present shape without advice and information ungrudgingly put at my disposal by numerous friends in Europe and India. I have thought it due to these friends to convey to them an assurance that the time and labour they lavished for the encouragement of the Scheme have borne some fruit; and with that object I submit to them this compilation of papers, including the Resolution of the Government of India cordially accepting the Scheme. The Indian University of Research has now been launched on its career.

B. J. PADSHAH.

Esplanade House,

Bombay, December 18th, 1899.

PREFACE TO THE "RESEARCH INSTITUTE AT BUITENZORG" (JAVA.)

I take this opportunity of thanking the Editor of the *Times of India* for the painstaking interest he has evinced in the Scheme for a Research Institute in India; and I am specially under obligation for the permission to reprint these studies of the Institute in Java.

The reader to whom this pamphlet appeals is doubtless aware that Mr. J. N. Tata has put a very large sum at the service of such a scheme; and that a Provisional Committee has undertaken to work out the preliminary steps. It is instructive to observe with what success the same idea has been realised in a neighbouring tropical country with an Oriental population dependant mainly on agriculture, a Government deriving its revenues largely from land and its products, and an important Planter interest deeply concerned in the prosperity of the same industry. The result is stated to be the advancement of science, services to agriculture, and the glory of the Dutch name.

The distribution of the financial cost that has made such brilliant results possible is a signal testimony that the general public are not blind to these results. The 44 per cent. contributed by the Educational Department shows that the educational value of such an Institution is by no means despised; the burden borne by the other departments of the Java Government, and particularly the 33 per cent. given by the planters, and the ten thousand florins with which the Amsterdam merchants subsidised the Publishing Department at Buitenzorg reveals the belief of shrewd business-men that a well-organised Institute of Research is a paying investment.

But not the least marvellous feature of Buitenzorg is the economy of the annual budget. Large savings are made possible entirely by the concentration of resources. It is clearly perceived how different lines of investigation may throw light on each other when pursued in the same place; and there is no frittering away of scanty means in the duplication and multiplication of petty concerns. As if to emphasize how differently we in India proceed in the matter, the same edition of the *Times of India* that published the articles here reprinted, reported that his Highness the Nizam is to have a Pasteur Institute of his own to be ready in six months. While we are feeling what a blot on statemanship it would be if means are not found for the collaboration of the Institution projected by the Rajah of Dhoipur, and the Institution projected by Mr. Tata, we are face to face with the revelation that enthusiasts in different parts of India cannot work in concert.

This must not be. I appeal to the Press of India to co-operate with us to conduct to success this national enterprise. I appeal to the Departments of Education to join hands to remove from themselves and us the reproach of our intellectual sterility; and I appeal to the enlightened associations of industrialists to furnish adequate funds, cement the alliance between science and production, and insist that no crotchet of theory, no local or provincial jealousies, no incompatibility between workers in different places and departments shall mar the institution under contemplation, and render hopeless its future success. I, on my part, pledge myself and pledge Mr. Tata that the location of the Institution will be decided not by our preferences, but by such obvious considerations, as central position, suitability of climate for work by professors and students, availability

of land, convenience for material to be investigated, already existing appliances, and the hospitality of the locality to such an Institution as measured by its pecuniary help. To have been beaten by Japan was a first humiliation hard enough to bear, and now to be beaten by Java?

B. J. PADSHAH.

Esplanade House,

Bombay, November 11th, 1898.

I.—Resolution of Government of India on the Scheme.

EDUCATION.

The 17th November 1899.

RESOLUTION.

No. 521.—The following papers are published for general information :—

- (1) Outline of a scheme for an Institute of Research in India.
- (2) Representation on the above subject submitted to His Excellency the Viceroy on his arrival in India.
- (3) Report of a Conference on the above subject held at Simla on 23rd and 25th October 1899 with the draft Bill as revised by them.

2. The Government of India accept the recommendations of the Conference; and they desire to place on record their appreciation of the generosity and public spirit displayed by Mr. J. N. Tata in making his munificent offer of an endowment for the proposed University of Research. They are confident that the proposed University will meet a great need and will contribute to the advancement of higher education and the development of the resources of the country. They will be ready to proceed to legislation as soon as the scheme has been matured in all its details; and they wish the undertaking every success.

3. In accordance with the request made in the last sentence of the Report of the Conference, the Government of India have requested the Government of Bombay to nominate an officer to arrange with Mr. Tata for the transfer of the property with which he proposes to endow the University.

A. H. L. FRASER,

Offg. Secretary to the Government of India.

II.—Proceedings of the Simla Conference.

The gentlemen invited by the Government of India to meet in Conference with Mr. J. N. Tata, regarding the proposed Research University, were present as follows :—

- (1) The Honourable Mr. T. Raleigh, presiding.
- (2) Mr. Jamsetji N. Tata (with his Secretary, Mr. Padshah)
- (3) The Honourable Mr. Justice Ranade, C.I.E.
- (4) Surgeon-General Harvey, C.B., D.S.O.
- (5) The Honourable Dr. Duncan, Director of Public Instruction, Madras.
- (6) Mr. Pedler, F.R.S., Director of Public Instruction, Bengal.
- (7) Mr. Sime, C.I.E., Director of Public Instruction, Punjab.
- (8) Principal MacMillan, Bombay.
- (9) Mr. A. H. L. Fraser, C.S.I., Officiating Home Secretary.

2. The Conference first discussed fully the manner in which the scheme should be launched, so as to keep in view the ultimate ideal and at the same time make progress as funds permit. The Conference were of opinion that it is an essential feature of the scheme to have a central institution for research, as well as a central authority to control the operations conducted under the scheme. And they were of opinion that there is ample room, and indeed a clear necessity for such a central institution.

3. At the same time, they realized the necessity for taking advantage of existing facilities for research, whether in the shape of special local facilities (as of trade, products, etc.), or in the shape of good laboratories or museums, and men qualified for scientific research. They acknowledged that, even under the unfavourable circumstances hitherto existing, students had shown in certain instances distinguished aptitude and capacity for

research; and they believed that much good would be done by the grant of studentships, and also, where necessary, by assistance to the teaching and supervising staff. While, therefore, recognizing that a central institution is necessary, and that there are certain departments of research (such as Technical Chemistry) which must even from the very first be provided for at that central institution, they recommended that at the outset every effort should be made to utilize existing facilities and so economise funds and resources. It is undoubtedly clear that certain branches of research must be conducted away from the central institution. But the Conference are of opinion that that institution should be gradually strengthened as circumstances permit.

4. The Conference also concurred fully in the view accepted by the Provisional Committee that certain parts of the scheme should be first carried out, and that the rest should follow as funds permit. They concurred in giving preference to Parts I and II, and leaving Part III to follow, though they were of opinion that the promoters of the scheme and its governing body ought to keep in view the scheme in its entirety. They were also of opinion that the scheme of studies and of subjects should be stated in the most general terms, and that provision should be made for its revision from time to time, so as to leave the authorities in charge of the work as free a hand as possible in taking up subjects that seemed specially at any time to demand attention, and in conforming to the progress of Science. In regard to Bacteriology, they were quite prepared to postpone action, both because there are many subjects to which the funds may at the first be at least as usefully applied, and also because they understood that the Government of India are taking such action as seems at present necessary in regard to this subject. They think that probably the best application of their funds to this subject, for the present at least, will be the provision of studentships in the Government institutions.

5. The Conference considered the question of the site of the central institution. It seemed to them that of all the sites named

the choice lay between Bombay and Bangalore. In regard to the former the main considerations were (1) the fact that it is the home of the founder (who, however, rather favours Bangalore), (2) that it is a great centre of commercial and industrial activity, (3) that it is easy of access from all parts of India and from England and (4) that a strong governing body could be easily obtained there. On the other hand, the climate, though not altogether unfavourable, is not bracing and is injurious to machinery and apparatus. It would not be so favourably regarded by Europeans as Bangalore, and in Bombay land is not available in sufficient quantity. If (as is believed) special concessions in respect to site, and aid in regard to the scheme generally, be made in Bangalore on condition of the institution being there, the Conference would recommend that site.

6. The Conference considered the name or title of the institution. There was a strong opinion in favour of the title "Institute" as more suitable than "University" to the objects in view. But in deference to the views of Mr. Tata and in consideration of the sentiment of the educated community of India, the Conference decided that it was expedient to adopt the well-known title of "University." They therefore decided to recommend that the institution be styled "The Indian University of Research." They were, however, of opinion that it should maintain its post-graduate character, and that it should, therefore, grant not Degrees but Fellowships.

7. The Conference are unanimously of opinion that there is great need for such an institution as has been indicated, that there is no reasonable ground for doubt that its work would be successful, that it would exercise a most beneficial influence on higher education and on the development of the resources of the country; and they strongly recommend it to the sympathy and support of the Government of India. They trust that the Government of India will express their favourable opinion on the scheme, and give the promise of necessary legislation to be carried out as soon as it is matured, so that an appeal may be made to the public for funds, and that the details of the scheme may be definitely settled.

8. The Conference then proceeded to revise the draft Bill, and determined to recommend the draft Bill as revised to the Government of India for publication. And at the request of Mr. Tata they resolved to ask the Government of India to nominate some officer to consult with him about the transfer of the property with which he proposed to endow the University.

Signed on behalf of the Conference.

T. RALEIGH,

Chairman.

25th October, 1899.

III.—Revised draft Bill to constitute a Research University.

Draft of a Bill to incorporate a University for the encouragement and promotion of advanced studies and research in India, under the name of "The Indian Research University," and to confirm and give effect to an Indenture for the endowment of the said University made between Jamsetjee Nusserwanji Tata of Bombay and _____ and others on behalf of the said University.

WHEREAS Jamsetjee Nusserwanji Tata of Bombay has proposed that a University may be established in India upon the lines and with the constitution suggested by him, and has offered, in case such University were established, to endow it with certain immoveable properties and securities of the aggregate value of Rs. _____ lakhs, subject to the terms of an Indenture already executed between the said Jamsetjee Nusserwanjee Tata of the one part and others on behalf of the said University of the other, which said Indenture is set out in a schedule to this Act. AND WHEREAS the said proposal and offer have commended themselves to the Government of India, and it is expedient to pass an Act for effectuating the purposes of the said Indenture. It is hereby enacted as follows:—

1. This Act may be called "The Indian Research University Act of 1900."

2. There shall be and is hereby constituted and founded a University with the name of "The Indian University of Research," by which name the Chancellor and members for the time being of the said University shall be and are hereby constituted and declared to be a body corporate by the name of "The Indian University of Research," having perpetual succession and a common seal, with power to acquire and hold property, moveable or immoveable, to transfer the same, to contract, and to do all other things necessary for the purposes of its constitution.

OBJECTS AND POWERS OF THE UNIVERSITY.

3. The said University shall have its seat in or near Bombay, and shall have power, so far as the funds and opportunities at its command permit, from time to time, to institute or subsidise Chairs and lecturerships in science, arts and literature, specially, with a view to the promotion of original investigations in all branches of knowledge, and to provide or assist in the provision of suitable libraries, laboratories and museums, and all other necessary appliances and to take over from Government and other public bodies or private persons willing to transfer the same, any and all such libraries, laboratories, museums, collections, together with any endowments and other funds, properties and benefits belonging to such institutions respectively, with the attendant obligations and engagements if any; and subject to the provisions of this Act to enter, in this connection, into all such special arrangements as the said University may approve of.

4. The said University shall have the power, upon examinations or such other tests of competency as it may from time to time approve, to confer Fellowships upon persons whose preliminary qualifications to be admitted to such examinations or tests shall be determined by by-laws as hereafter provided.

5. In addition to the above purposes, the said University may apply its funds to all objects which have for their aim the advancement or diffusion of learning.

CONSTITUENT BODIES OF THE UNIVERSITY.

6. Subject to the powers hereinafter reserved to the Government of India, the management of the University shall vest in (a) a University Court and (b) a University Council.

7. His Excellency the Viceroy for the time being shall be *ex-officio* the visitor of the University, and the Governor of Bombay shall be *ex-officio* the Chancellor.

The Chancellor shall appoint a Vice-Chancellor who shall hold office for 2 years.

8. The University Court shall consist of the following persons, namely :—

- The University Court.
- First.*—The Chancellor.
- Secondly.*—The Vice-Chancellor.
- Thirdly.*—One nominee of the Supreme Government.
- Fourthly.*—One nominee of the Local Governments of Madras, Bombay, Bengal, North Western Provinces, Punjab, Burma, Central Provinces and Assam.
- Fifthly.*—One nominee of each of the other Universities in India.
- Sixthly.*—One nominee of the said Jamsetjee Nusservanji Tata; and on his death, one nominee of the five “Managers” of the Endowment Fund (referred to in the annexed indenture.)
- Seventhly.*—Nominees of benefactors of the University, whether Princes, Local Governments, Local Bodies or Associations, Chambers of Commerce, or Private Donors.

Every person who contributes to the endowment of the University by a gift of property or securities yielding an annual income of not less than fifteen thousand rupees shall be entitled during his own life to nominate one member of the University Court.

Every person or body of persons making an annual subscription of not less than fifteen thousand rupees to the funds of the University shall be entitled to nominate one member of the University Court while the payment of such subscription is continued.

Eighthly.—Four nominees of the University Council.

9. Every nominated member of the University Court not being the nominee of a benefactor shall hold office for five years from the date of his appointment, and at the end of each term he shall be eligible for re-appointment. A person nominated by a

benefactor to be a member of the University Court shall hold office for such period not exceeding the period for which the right of nomination subsists as the person or body of persons making the nomination may determine.

10. All members leaving India without intimating their intention of returning thereto within one year shall be considered to have resigned their office.

11. In the event of the death or resignation of any of the appointed persons of which the University Court shall consist before the term of office of such person has expired, the person, authority or body by whom the original appointment was made, may appoint another person to hold office for the then unexpired residue of the term for which the person so dying or resigning was originally appointed.

The University Council. 12. The University Council shall consist of the following persons, namely :—

First.—All the Professors of the said University.

Secondly.—The nominees of the University Court, not exceeding four in number, nor exceeding one-half of the number of Professorial Members of the Council.

Thirdly.—One representative to be elected by the Assistant Professors from their own number.

The University Court shall have power to nominate any person teaching or superintending any course of special study or research in connexion with the said University to be a Professor.

POWERS AND DUTIES.

13. Until by-laws are framed to regulate the proceedings of the University Court, that body shall meet at the summons of the Chancellor or Vice-Chancellor, and may make arrangements for its own adjournment and appoint committees. Five members shall form a quorum.

The University Court.

14. The University Court shall have the custody and control of the property and income of the University, and may confer Fellowships on candidates declared to be qualified by the University Council.

15. The University Court shall, within twelve months after its first meeting, make by-laws for the due and proper exercise of the powers conferred, and the performance of the duties imposed by this Act, and in particular enact by-laws for the nomination of nominated members of the Court, for the regulation of the procedure to be observed at its meetings, for fixing the time and mode of convening its meetings and the quorum thereat, for the determination of the mode in which votes shall be taken on questions submitted for its consideration, for the regulation of its executive business, for the appointment of Professors and Fellows and of all such officers as may be deemed necessary, and the settlement of the terms on which all such officers shall hold their offices, for regulating appeals from the Professorial Council to the University Court and for prescribing the form, custody and conditions of use of the Common Seal; and touching all executive and financial matters whatsoever, but not so as to contravene the general objects and provisions of this Act. The University Court may from time to time amend or revoke any by-laws so made, and make for any of the purposes and objects abovementioned any additional by-law or by-laws. Provided always that all by-laws made as aforesaid and any by-law amending or revoking any such by-law shall have force or effect only if approved of by the Governor-General in Council.

16. The Vice-Chancellor shall preside at all meetings of the Court in the absence of the Chancellor. In the absence of the Chancellor and Vice-Chancellor, the members of the Court who are present shall elect one of their number to be President.

17. The University Court shall hold an Ordinary General Meeting at least once a year to pass the budget of the year and transact any other business brought before it.

18. The University Court shall, for every appointment of a Professor in any branch of learning for which a Chair exists or is created, nominate a Committee in London of not less than three persons, two of whom at least shall be experts in that branch of learning. Nothing in this section shall apply to cases of re-appointment.

19. Appointments on the teaching staff below the rank of Professor shall be made by or with the sanction of the University Council, subject to the confirmation of the University Court; and officers so appointed shall be dismissed only with the concurrence of the Court.

20. The University Council shall frame courses of study and investigation in the said University, and shall, subject to the provisions of this Act, regulate the admission of students, their discipline, examinations and presentation to the University Court for the grant of Fellowships and Diplomas, shall award Scholarships, and travelling studentships and disburse moneys voted by the University Court for any purpose connected with the advancement of learning and original investigations: provided that moneys required for the said disbursements shall be specifically voted by the University Court in the Annual Budget.

21. The proceedings of the University Council shall be regularly communicated to the University Court, which shall have the power to require the reconsideration of any decisions of the Professorial Council, except in matters relating to cases of discipline and courses of study and investigation.

22. The University Council on its own initiative may, and on the requisition of the University Court shall, suspend any member of the Teaching Staff; but no Professor shall be dismissed except with the concurrence of the University Court and the Council; or in case of disagreement by the Governor-General in Council.

MISCELLANEOUS.

23. The accounts of income and expenditure shall be submitted for audit and examination once every year to the Accountant General of Bombay, who shall examine and audit the same in the same manner as the accounts of any department or office subject to the control of the Supreme Government.

IV. Outlines of a Scheme for a Research University for India.

It is proposed to found an Institution which shall be, or correspond to, a Teaching University for India, its primary aim being to teach, and not to examine. The Diplomas, therefore, will be conferred on those who have completed a certain course of higher education.

This work of higher instruction will be conducted on the principles followed now in Europe, *e. g.* in the *German Seminaria*, the *French Conferences*, and the English and American Research Classes. These courses will be the beginning of a purely specialist training.

In order not to interfere with the existing agencies, the new Institution will take up teaching where the Colleges of the existing Universities leave off—the new courses will be post-graduate.

New specialist courses, which are post-graduate, will naturally be professional and technical rather than simply liberal. A School of Sanitary Science and Practice for qualified medical men, a School of Pedagogics for those intending to be higher secondary teachers (inspectors, headmasters, etc.), and a School for higher Technical Studies are some of the obvious directions of development.

It is not proposed to take all these up at once; the order in which they may be proceeded with will be best arranged by a Committee.

It is not intended to cut off post-graduate students from education in Europe; it is contemplated to select the best for further training in Europe or America with a view to their future return to this country.

It will be necessary to make ample provision for Scholarships and Fellowships both for the students in the Institution and for those who proceed from it to Europe or America.

The development of a scheme so complex must entail a vast capital and annual expenditure. The construction of libraries,

laboratories and museums—the invitation to specialists to teach and prosecute research—all this must require large sums of money.

To secure the necessary financial support by making a general appeal for funds, and to take the preliminary steps in connection with the scheme, and to obtain a short legislative enactment enabling the Institute to hold property, the undermentioned gentlemen have been invited to form themselves into a provisional Local Committee :—

Chairman—THE VICE-CHANCELLOR OF THE UNIVERSITY OF BOMBAY.

Vice-Chairman—THE HONOURABLE MR. JUSTICE RANADE.

Members—THE HONOURABLE MR. P. M. MEHTA,

THE HONOURABLE DR. BHALCHANDRA,

THE HONOURABLE MR. JUSTICE BUDROODIN TYEBJEE

THE HONOURABLE MR. R. M. SAYANI,

THE DIRECTOR OF PUBLIC INSTRUCTION,

MR. N. N. WADIA,

PROFESSOR GAJJAR,

MR. ARDESIR FRAMJI,

MR. B. M. MALABARI,

MR. JAMSETJI N. TATA,

THE PRINCIPALS of the Elphinstone, St. Xavier's,
Wilson, and Grant Medical Colleges,

DIVAN BAHADUR MANIBHAI JASBHAI,

DR. R. G. BHANDARKAR,

THE HONOURABLE MR. CHANDAVARKER,

MR. GRATTAN GEARY,

MR. T. J. BENNETT,

RAO BAHADUR MANSUKHRAM SURAJRAM and

B. J. PADSHAH, *Hony. Secy.*

His Excellency the Governor and Chancellor of the University of Bombay has kindly consented to let it be known that the proposed scheme has his personal approval and sympathy.

V.—Scheme of Studies

The following is the scheme of studies recommended by the Sub-committee as that which should be put before the public in connection with the proposed University or Institute of Research :—

- A. Scientific and Technical Department.
- B. Medical Department.
- C. Philosophical and Educational Department.

A. SCIENTIFIC AND TECHNICAL DEPARTMENT.

(Details.)

1. For admission to the Research Institute (or University), students who have graduated in Arts with Mathematics or Physics and Chemistry as optional subjects; graduates in Science, Engineering and Medicine, and students who have passed the Intermediate Examination for the Degree of B. Sc. and Diplomates in Agriculture should be eligible.

2. The subjects in which instruction is to be given and researches conducted should include the following :—

(a) Physics—Advanced courses in all Departments, including Mathematical Physics and Electric Engineering.

- (b) Chemistry—(1) Advanced Inorganic Chemistry.
 (2) Organic Chemistry.
 (3) Analytical Chemistry.
 (4) Agricultural Chemistry.

(c) Technological Chemistry applied to different Arts and Industries.

3. For the above courses the following Professorial Staff will be necessary :—

- (a) One Professor.
 One Assistant Professor.
- (b) Two Senior Professors for (2) and (3).
 Two Junior Professors for (1) and (4).
- (c) One Professor.

4. Laboratories, etc. —

One Physical Laboratory.

One Chemical Laboratory with various Departments.

One Technological Museum.

One Library.

5. Estimate of probable expenditure for staff and Laboratories :—

	Per annum.	
	Rs.	Rs.
Professor of Physics	18,000	
Assistant Professor of Physics	9,000	
Two Professors of Chemistry	36,000	
Two Junior Professors	18,000	
One Professor of Technology	27,000	
		<u>1,08,000</u>

Laboratories —

Physical, Initial outlay Rs. 1,00,000 (apart from building)—

	Rs.
	Per annum.
Maintenance	10,000
Demonstrators and Mechanician	5,000

Chemical, Initial outlay (apart from building) Rs. 1,00,000—

Maintenance	10,000
Demonstrators and Glass blower, etc.	10,000

Technological Museum, Initial outlay (apart from building) Rs. 25,000—

Maintenance	2,000
Salary of Curator	1,000

Library, Initial outlay (apart from building) Rs. 50,000—

Additions	5,000
Librarian	1,200

39,200Total Initial outlay Rs. 2,75,000,
excluding buildingsTotal (annual) Rs. 1,52,200
Contingencies " 4,800(With adequate buildings, the
initial outlay would be about
10 lakhs)TOTAL .. 1,57,000

B.—MEDICAL DEPARTMENT.

(Details.)

1. The subjects to be dealt with should be :—

(a.)—Bacteriology.

(b.)—Hygiene.

(c.)—Pathological and Physiological Chemistry.

2. The branch of Hygiene would include sanitation, examination of water, air, analysis of food-stuffs, etc. Branch c. would embrace researches on the chemical constituents of the body, etc., in health, and of diseased tissues, etc., toxins and anti-toxins.

3. The Staff required will be:—

				Per annum.
				Rs.
(a.)—One Professor	...	...	...	18,000
One Assistant	...	...	...	6,000
(b.)—One Professor	...	...	...	18,000
One Assistant	...	...	...	3,600
(c.)—One Professor	...	...	...	18,000
Two Assistants	...	...	...	7,200
			TOTAL ...	<u>70,800</u>

4. Total Initial Outlay:—

Buildings	{	Laboratories ...	...	...	Rs.	1,50,000
	{	A Museum { For Bacteriology.	...	...
	{	For Hygiene	...	...
	{	A Library already provided for	...	...
	{	under I	...	...
Apparatus	...	...	...	...	...	50,000
Books in the Library at the commencement	...	...	...	...	...	<u>10,000</u>
				TOTAL ...		<u>2,10,000</u>

5. Annual Expenditure:—

				Rs.
Salaries	...	...	...	70,800
Grants to the Museums and Laboratories	...	...	...	10,000
Additions to the Library	...	...	...	1,000
Contingencies	...	...	...	3,200
			TOTAL (Annual)	<u>85,000</u>

C.—PHILOSOPHICAL AND EDUCATIONAL:

(Details.)

1. SUBJECTS :—

- (a) Methods of Education.
 (b) Ethics and Psychology.
 (c) Indian History and Archæology.
 (d) Statistics and Economics.
 (e) Comparative Philology.

2. STAFF :—

	Rs.
5 Professors	60,000

3. Annual Charge :—

Salaries	60,000
Additions to the Library	3,000

Total (Annual)...	63,000
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4. Initial Outlay :—

Books and manuscripts	1,00,000
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TOTAL ESTIMATES.

(Initial.)

	Rs.
Scientific and Technical	10,00,000
Medical... ..	2,10,000
Philosophical and Educational... ..	1,00,000

Total (Initial)...	13,10,000
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(Annual.)

	Rs.
Scientific and Technical	1,57,000
Medical	85,000
Philosophical and Educational	63,000

Total (Annual)...	3,05,000
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Note.—To this has to be added an Estimate for Scholarships, Fellowships, and Travelling Fellowships.

The order in which the various subjects will be introduced and the extent to which the Departments will be further developed will depend on the support received from the public.

B. J. PADSHAH,

Honorary Secretary.

VI. Extract from a Report by the Director of Public Instruction.

I believe that a beginning would be most usefully made if from the funds already available, one or two experts in Chemistry and Technology were brought out to this country, say in November next, and were authorised to spend the next cold weather in a town in India, enquiring into the resources of the country, visiting various centres of industrial activity, and formulating an opinion as to the eventual location of the Institute, and the immediate expenditure necessary on buildings and their accessories. I conceive that such a step as this would in no way prejudice the ultimate development of the whole scheme, but would on the contrary be approved generally as being calculated to most materially assist the controlling body of the Institute in the decision as to any subsequent action.

VII.—THE RESEARCH INSTITUTE AT BUITENZORG.

(*Editorial, "Times of India," November 10th, 1898.*)

The Research
Institute at
Buitenzorg.

In another column we publish an account of the Botanical Garden in Java, which is the centre of ten laboratories, herbariums, and libraries, all contributory to agricultural research. It is not a little gratifying to our national pride, and confirmatory of our reputation for colonization, that the Dutch masters of this Malayan island admit having been awakened to a sense of their responsibility to the subject populations of Batavia by the five years' rule of Sir Stamford Raffles and his staff. It is due, to our neighbours and disciples to acknowledge that they have in many ways improved upon the model; and nowhere have they so completely surpassed us as in the promotion of agricultural research. Governments which derive their principal revenue from land frequently enough remind their subjects that this revenue is in no wise taxation but rent; but they forget that European landlords have acknowledged duties to their poorer tenants in the shape of improvement and suggestions for progress. The British Government of India, and the Dutch Government of Java, may, however, claim immunity from this reproach; irrigation works, railway communications, model farms, the entertainment of specialist chemists and bacteriologists—all testify to the zeal of these model landowners. Nevertheless, it remains to be remarked that much of what we in British India do is fragmentary work, put up haphazard as the exigencies of the moment dictate, without the least effort to bring the various departments into line or into relation with each other. We plant a Bacteriological Laboratory in one place, Chemical Examiners in another, and we talk of establishing a Research University in a third. We bring out experts at long intervals and then pigeon-hole the reports which everybody admits to be master-pieces. We send civilians to be trained for Directorships of Agriculture and army doctors for chemical examinerships and mint assaying. No doubt there are always good reasons for each of these steps; but the whole strikes one as wanting in continuity of texture,

system, and plan. The Mysore Government has just appointed an Agricultural Chemist to deal with the coffee plant; the indigo planters are about to bring out an expert chemist to show them the way to rescue their industry from threatened ruin. We instinctively contrast with this the one hundred and twenty research chemists employed all the year round by one firm near Frankfort, and we almost feel that if their artificial indigo ultimately drives out our natural product from the market, we shall have deserved our misfortune.

In India we do not lack enterprising leaders of industry; they organize themselves in association—Chambers of Commerce, Associations of Planters, Associations of Millowners. They make an able battle for their interests whenever these are, or appear to be, threatened. What they do not do is to secure a high qualification amongst their employes by presenting opportunities for high training; they do not comprehensively serve the interests of their business by sending pioneer merchants or travellers in search of new markets, or fitting up laboratories under the direction of skilled scientists to demonstrate the new utilities of their products. The German chemists have created a new world of colour; we are on the eve of being told that our natural dye-stuff is not wanted. In Paris, the Chamber of Commerce has organised two or three great commercial colleges; an Industrial Association largely supports the chemical school at Mulhausen. It is here that we have most to learn from our Dutch neighbours. The planters of Java, the merchants of Amsterdam, find it to their advantage to give six thousand pounds a year towards the maintenance of the Institute at Buitenzorg, in return for which laboratories are set up to specially investigate the wants of the planters—the growth of tobacco or coffee. So far is this carried that regular visits are paid to the plantations, and different laboratories are set apart for the benefit of the different processes of tobacco-growing by the native peasant and the European planter. A general laboratory of Agricultural chemistry examines soil, fermentation, and the bacteriological aspects of agriculture. The vegetable and animal pests that beset tropical vegetation—the insects, the parasites—have special laboratories assigned to them. The publications are largely practical, treating of such subjects as insects hostile to the coffee-plant. A trial garden systematically experiments on the possibility of growing new products which the commercial

department of the Government may discover to have a future in the market. Vanilla, cinchona, and cocoa were so introduced. We contrast with our own slovenly efforts, fitful, half-incredulous, half-inexpert, these systematic, thorough-going, continuous, and regular researches at Buitenzorg ; the faith of the planter in science as manifested by the sacrifices is justified by results ; the Government of Java recognising its duties as landlord, merchant, and manufacturer, as well as ruler, is amply repaid not only in commercial returns, but in the gratitude of *savants* of all countries, in the service to agriculturists, and in the scientific fame of the Institute of Buitenzorg.

VIII.—A RESEARCH INSTITUTE IN JAVA.

(“ *Times of India*,” November 10th, 1898.)

An interesting article from the pen of Monsieur Chailly-Bert describes, in the *Revue Generale des Sciences*, the efforts made by the Dutch to promote original investigations in the Indian Netherlands. It appears that the brief but beneficent rule of Sir Stamford Raffles in Java gave the Dutch masters of that island a lesson which they took to heart when their old dependency was restored to them. Under the direction of Professor Reimwardt, as early as April, 1817, they found a botanical Garden in order “to procure for the Netherland Colonies the knowledge and the researches which our neighbours possessed upon theirs” and secondly, “to renew and to make the Dutch name famous. “To serve science, to help agriculture, to carry high and far the renown of Holland—these were the avowed aims of the new foundation.”

It was lucky for the fortunes of the new venture that they were always directed by men who with scientific eminence combined administrative ability, and who realised the value of *system* and *plan* in promoting the institution. Starting with the clear idea that botany and vegetable physiology could nowhere be so well studied as in the tropics, they deliberately promoted those conditions which gave the study of tropical vegetation its specific value. According

to Monsieur Chailly-Bert, the present equatorial climate at one time prevailed over the globe, but the climatic changes since having induced the alternations of hot and cold seasons in the temperate and frigid zones, have unfitted most vegetable species for the altered conditions of life. It is only in the tropics that the earth's flora can be seen in their full richness and in their natural conditions. In other zones, civilization and science have thriven beyond anything in the lower latitudes, with the result that universal laws of plant-life have been hastily deduced from limited observations; external causes, such as seasonal effects, have been summoned to account for every effect observed, and internal influences have come to be neglected. It is as if the laws of animal physiology were to be laid down by an exclusive study of monkeys, remarks M. Chailly-Bert.

If the function of a Tropical Institute of Botany be to correct the errors that have crept into science through the unfortunate fact that the land of the *savants* lies one way and the land of botanical specimens another way, it is easy to see how we are to proceed to organise such an institution. "A region which did not possess any University centre of scientific investigation should not only give to the botanical garden an organisation which should be a good instrument of work, but should maintain a complete workshop—laboratories, museums, libraries—to enable examination of observations, to permit verifications of hypotheses, and to win for the colony the glory of contributing to science, and deriving practical advantages."

The magic wand of General Van des Bosch had, by means of what is known as the culture system—to quote an English writer—"in twenty-five years quadrupled the revenue, paid off the debt, changed the yearly deficit to a yearly surplus, trebled the trade, improved the administration, diminished crime and litigation, . . . and more wonderful still, nearly doubled an Oriental population giving contentment with the rule of their foreign conquerors to ten millions of a conquered Mussulman race."

The culture system which effected this involved the State in great responsibilities for the growth of certain products in active demand in Europe, and for the financing and sale of these products when exported. Thus, to the interest of the Government in agricultural improvement as the biggest landlord of the island, was added all the interest of the Government as manufacturer and merchant.

Therefore, we are not surprised to find that a Trial Garden and Laboratories for researches on the growth of tobacco and coffee, and for seeking relief from parasites and pests, have been in recent years essential features of this wonderful institute. There was, however, no attempt to barbarise research by submerging the purely scientific aspects under the pressure of a cry for marketable results. The consequence is exultantly stated: "the higher the Buitenzorg raised itself in scientific researches, the more the colonies gained in wealth."

Not only was every detail subordinated to a general idea; there was not the least trace in any step of the patch-work workmanship which we too frequently see nearer home. We can scarcely imagine that in Java there would be any toleration of institutions doing cognate work entirely out of relation with each other. We can hardly conceive a Bacteriological Research Laboratory, a Health Institute, a Pasteur Institute, a Research Institute (Mr. Tata's), all languishing for want of adequate funds, when a judicious concentration might give them strength and resource. The location of institutions can scarcely then be left to chance; at any rate, the Research Institute in Java was planted where it was, of deliberate choice. "For a tropical garden, for the culture of plants whose life is never suspended, . . . two elements are necessary—the heat and the water; for heat there is the question of the sun; and under the same latitudes as of Java, the sun hardly sets. For water, there is the question of rain, but not of rain by intervals; but regular, continuous rain." Now at Buitenzorg, encircled by mountains, clouds are arrested; and there is an abundant and indeed, devastating rainfall; which, perhaps, is increased by the fact that for reasons connected with landed proprietorship it is a sparsely populated tract where forests luxuriate, promoting both evaporation and rain. A garden in such a place "is a greenhouse. Nature spontaneously furnishes the elements—the heat and humidity which float in the air." Buitenzorg was, therefore, fixed on as the proper abode for the institute.

In organising the garden, its scientific purpose was steadily borne in mind, and the conditions fulfilling the purpose thought out. "Above all, it cannot be, ought not to be, like one, of our European gardens—Kew, Paris, or Berlin, full of the patterns of flora from all parts of the world which are made to live, or rather *vegetate in artificial conditions*. No, the local garden should contain only tropical and intertro-

pical plants, which placed in their *natural* conditions would furnish to the students and the savant precisely what they have come so far to find." Ten thousand distinct species, with at least two samples of each, represent the present collections; but the very wealth of the collection would appal the young investigator unless this living world was carefully classified—classified on a system intended to lead up to orderly observation. In this classification, warning was taken from existing examples to avoid two opposite errors. In the capital of Ceylon an attempt has been made "to get in a limited space, somehow within reach, the view of the *original forest*, with its luxuriance, abundance of life, its heat, its variations in weather, its millions of organisms, which are interlaced penetrated, and superposed." In British India and Singapore we meet with "beautiful *gardens*, well kept and scraped, very cool, with green lawns well-cut and combed, and groups of trees and flowers varying according to colour and form." "The garden of Buitenzorg is equally different from both these extremes. Its extent is marvellous, points of view abound there, certain sections of it show tropical vegetation in all its strength, *e.g.*, that of palms which contain all the known species; palms rise over palms; and what palms! (thick, solid, large; the trunks stretching out, raising themselves up) . . . There are, indeed, "green lawns, gentle slopes the basins filled with such strange flowers as the *Victoria Regia*, avenues of magnificent and rare trees; but all that is only the accessory part. The garden of Buitenzorg has never sacrificed the useful and the scientific for the picturesque or the beautiful. The characteristic point, the merit of the garden consists in a very beautiful collection of tropical plants arranged in the most perfect order, according to the precedence most convenient for researches. . . . The plan is very simple. Each genus is grouped on the same ground with its various members, . . . each portion of the ground devoted to a family is marked, numbered, and catalogued on a plan. . . ." It took no less than seven years to transplant everything according to this adopted plan. This classification is so convenient for investigators that large numbers annually come for brief periods for original work. They are all Doctors of Sciences or Professors before they start; and for further facilities for these talented men, laboratories and museums have been annexed.

The laboratories are ten in number. They embrace pharmacology, agricultural chemistry, agricultural zoology, phytopathology and physiology, a botanic laboratory reserved only for foreign savants, laboratories for the study of tobacco, coffee, and of primeval forests. The Laboratory of Agricultural Chemistry studies the nature of soils, the ingredients to be introduced there, the fermentations of the products, their bacteriology, and plants sent by private individuals to be examined. The Laboratory for Primeval Forests studies wild vegetation. "Everywhere in Java the plants are attacked by parasites and epiphytes. The real vegetation of a tree is rarely revealed before the height of 20 or 25 metres. Below that it is hidden by parasitic leaves. . . ." The Laboratories of Agricultural Zoology and Phytopathology study animal and vegetable parasites which infest plants, *e.g.*, on the sugar-cane no less than 150 insects have been counted.

In addition to these, there are a Herbarium consisting of tropical and forest flora, a library of about 6,000 volumes, a publishing department for catalogues and transactions, and brochures, giving practical advice and information to the planters, *e.g.*, one on "insects inimical to the growth of coffee."

Finally, there is a practical Trial Garden, apart from the Botanical Garden, where new growths are tried for the market, as, for instance, vanilla, cinchona, or cocaine alkaloid extracted from cocoa. The Garden has a director, a hundred workmen, a supply of tools, a chemical and physiological laboratory.

No wonder that from Holland and Belgium, Norway and Sweden, Germany and Italy, botanists flock to this admirably administered institution. With quiet sarcasm M. Chailly-Bert notices the absence of the English and the French savants—the first, he suggests, through self-assertive patriotism, the second through indifference.

An institution for pure research without students, with recruits, the youngest of whom must be a Doctor of Science, annually pouring in, with ten, fully equipped laboratories, with botanical gardens and forests, ministering to the practical needs of the planter and the ryot through researches in agricultural chemistry, entomology and phytopathology, by publications of results, interesting to the practical agriculturist, by visits to plantations and examinations of things

have it from men in the Educational Department who had been originally chosen for their scientific knowledge, that, when once established in a position, they find their time so taken up with teaching subjects *other than* their own science, that they have to abandon entirely the hope of doing any original work, and have not even time to keep up their knowledge of what is being done at home and abroad in advancement of their particular science.

The consequence is, that they fall behind, and cannot keep their knowledge up to date. The late Mr. S. A. Hill, of Allahabad, who was a skilled chemist when he came out to India, acknowledged to me that this was the case, and that he had not been able to keep himself acquainted with the advance made in chemistry, still less to carry out any original work in the science.

UNSATISFACTORY NATURE OF CHEMICAL EXAMINERSHIPS.

Another instance of the way in which no encouragement is given to scientific study is seen in the system by which appointments are made to the position of Chemical Examiner. Instead of selecting for these posts men who have been carefully trained in chemistry, and more especially in analytical chemistry, the appointments are generally given to men who have had nothing more than the class instruction in chemistry and the test-tube experience of the ordinary medical student.

Those who have any acquaintance with the facts know how small are the demands made upon the chemical knowledge of a medical student in order to enable him to pass his qualifying examinations, and it is simply this, or the recollection of it, which the "Chemical Examiner" in India has to rely upon when he enters upon his work. The men chosen are medical men, who when they see the chance of adding to their income by taking a "Chemical Examinership" as well, do so, and at once find themselves, armed only with the remains of their student-days' knowledge, brought face to face with matters requiring not only special acquaintance with chemistry, but also considerable analytical skill and experience. The subjects dealt with by Chemical Examiners,

are of a most varied description, from poisoning cases in which human life is at stake, down to analyses of Government stores, dynamite, kerosine oil, beer, raspberry essence, disinfecting powders, and lozenges ! Clever indeed must the medical man be who can do justice to such a varied selection on the strength of his medico-chemical experience !

What happens is, that a man bumbles on at first, doing the best he can, and, if he be a man of ability, in course of time he gets to know how to deal with the usual run of things submitted to him, and what he does not know he finds out from books. But the system is very far from being satisfactory, and it is not to be wondered at that the Reports of the Chemical Examiners are not fully credited in the Law Courts. On looking over the Reports, I find that medico-legal cases and examination of Government stores form the bulk of the work, and that the important matter of the adulteration of staple foods is one which but seldom comes forward.

MUNICIPAL CHEMISTS.

The calling of a Civil Surgeon is medicine, not chemistry, and unless he has had a special training in chemistry, he cannot be properly qualified for holding a Chemical Examinership. Similarly imperfect and unsatisfactory are, in most cases, the examinations of samples of drinking water made on behalf of Municipalities. The investigations are incomplete ; the collection of samples is too often left to messengers (*peons*) who may take them from anywhere and anyhow. Added to this, the number of samples sent, and the kind of analysis made, are determined rather by the cost than by the importance of the enquiry, and it is left to the chemist just to analyse what is sent to him, instead of carefully selecting such samples as shall be germane to the enquiry.

CENTRAL TRAINING INSTITUTION FOR PUBLIC SCIENTIFIC APPOINTMENTS.

I cannot but think how much better it would be if there were one Central Institution, say at Calcutta, where, with able professors and the best laboratory accommodation, men might be trained so as

to qualify for filling the posts of Chemical Examiner, Municipal Chemist, Sanitary Inspector, and such like. As vacancies arose in these posts, they might be filled by men who had passed out with a qualifying certificate. In such an Institution, too, men might be trained in knowledge of agricultural as well as of general chemistry, and the requirements of India could in this way be met from India itself, and not be the subject of continual reference to England. In some such way, too, there would be an opportunity for the development of original scientific work in India.

X.—MEMORANDUM

by the Hon'ble Mr. Justice Ranade, summing up 76 opinions of experts, &c., on the Scheme.

The accompanying précis gives the summary of the opinions of 76 authorities consulted about the draft-scheme of studies and the draft-bill of the proposed Imperial University. Of this number 19 belong to the Bombay Presidency, and 7 to the Native States of Baroda, Bhavnagar, Gondal and Morvi (in Kathiawar), one from Cambay, and there is also the opinion of the Director of Public Instruction, Berars, included in this number.

Thirteen are European Officers of the Department, Principals of Colleges and Inspectors of schools, with the Director of Public Instruction, Mr. Giles, at their head; the remaining 13 are natives, two Principals of Colleges, 2 Directors of Public Instruction, 1 Inspector, 3 Members of the Judicial Service, and the rest are officers in Native States.

There are 8 opinions of the Punjab authorities consulted: 1 Director, 2 Inspectors, 2 Principals, and 3 Head Masters; 6 Officers from the Central Provinces have favoured the Committee with their opinions; five of them being Englishmen, 3 Inspectors, 2 Principals, 1 Inspector-General and 1 Native Principal. From Central India 6 Officers have sent their opinions, including the Residents, 3 Principals, and 1 Inspector-General of education. The Resident at Cashmere, and at Jeypore, and the Dewan of Cochin, and Her Highness the Maharani Regent at Mysore and the Senior Member of Council and the D. P. I., and a nobleman of Jeypore have also favoured the Committee with their views.

From the North-West Provinces and Oudh, the Committee has received opinions from Mr. Theodore Beck and the Director of Public Instruction of N.-W. P. and Oudh. From Bengal 10 opinions have been received, 2 of them being those of Justice Bonarji and Dr. Ray, and 4 Principals and 1 Professor. In all thus it would be seen that excepting the Madras Presidency* all the Provinces in India have responded to the call made upon them—Bombay, Berar,

* The Director of Madras has been good enough to intimate that the opinions of experts of his Province will be transmitted on receipt. Dr. Duncan, acknowledging the Articles on the Java Research Institute, wrote that in his view the establishment of a similar Institute would be of enormous benefit to India.

Central Provinces, N.-W. P. and Oudh, Bengal, Punjab, Baroda, Kathiawar, Jcypore, Cashmere, Central India, Rajputana, Cochin, and Mysore.

2. These opinions may be arranged under eleven different heads: (A) Designation, (B) Location, (C) Criticism on the scheme of studies, (D) Will students come? (E) Will they find employment? (F) Constitution, (G) Additional subjects suggested, (H) Miscellaneous, (J) Advantages and disadvantages, (K) General advice, and (D) Support expected.

3. With regard to designation there is almost an unanimous opinion that if the scheme is to be a post-graduate teaching University and a Research Institute, there is no objection to the name Imperial University being given to it as being the most intelligible and attractive. Without the power of granting degrees the scheme will not flourish. Only three or four officers seem to object to the idea of an Imperial University, but their objections are met by the replies given by Principal Hathornthwaite (Bombay), and Mr. Bell (Punjab), Mr. Sharp (Nagpur), and Mr. Dalal, D. P. I. of Baroda; Mr. E. Giles, of (Bombay) thinks the discussion of the question is premature.

Dr. Ray and one or two others in Bengal, and a similar number in N.-W. P. and Punjab, seem to think that instead of starting a separate institution combining the function of a teaching University and a Research Institute, the money should be utilized by helping existing Institutions with additional chairs, and founding scholarships to be held in India and England by selected students. This objection will be considered later on. For the present it may be noted that the name seems not to meet with any opposition and the Punjab University has passed a most sympathetic resolution in support of the new scheme.

4. With regard to the location, 41 replies referred to this point. Mr. Giles and a few others think the discussion of this question to be premature. Nearly half the opinions are in favour of Bombay. Calcutta comes next. Poona, Nasik, Jubbulpore, and Nagpur find smaller number of supporters, while Naini Tal, Coonoor, Panchgani, London, Allahabad, Lucknow, Delhi, Bangalore and Roorkee have

been suggested by one or more gentlemen. Climate, easy communication, nearness to great industrial centres and cheapness of land and living, suitability for Bacteriological work — these are the considerations which have been suggested, as the points to be chiefly attended to. Taking Bombay, Poona and Nasik together, the majority of those who have given their opinion favours the Bombay Presidency as combining these advantages in largest measure. The most satisfactory feature is that many men not connected with the Bombay Presidency favour some place near Bombay more than in any other part in India.

5. As regards the third head about 52 gentlemen among those consulted have given their opinions ; and these will be found summarised in the précis. So far as these criticisms relate to details they will be found useful by the Committee when they set to work in a practical manner. It is natural to expect a variety of opinions as to which class of studies should be taken up first and which should be postponed. There are many who think that the third or philosophical department should be the last to receive attention, as it is already provided for in the existing Universities. The general inclination seems to be in favour of confining attention for the present to the first class of studies—technical and scientific. Next, the Medical branch should be taken up. It is not necessary here to notice the details of chairs, salaries, and additional subjects. The criticism of some of the authorities from Bengal, and North India, and two or three gentlemen from Bombay also, go to the root of the matter, and they think that the scheme is defective because it seeks to combine the functions of a teaching University, a Research Institute and a technological school. These critics think that there should be no such combination, and that the scheme should be exclusively devoted to research work or to supplying laboratories or libraries as many of them would promote the main object of the scheme by strengthening the existing colleges and institutions with new chairs, and by attaching select students to learn under specialists brought out to India, and then sending them to Europe to complete their training. This alternative scheme as observed above goes to the root of the matter. It would obviously defeat one of the chief objects of the founder who has very strong ideas about the necessity of a teaching University which, while it will not interfere with existing Universities, will take up their best graduates at the stage where they are left to themselves

and give them a final course of finished teaching under the best masters. The founder attaches as much, if not more, importance to this work as to research work pure and simple. The general inclination of a very large majority of the authorities consulted is in favour of this combination, and as our colleges can not be as in England located together within the same town, the only practicable and efficient way of securing a teaching University in India is to bring the best men from all places to one Central University and try to utilize our resources to the best advantage. Under these circumstances, it appears that the minority, who advocate a Research Institute pure and simple, or the devotion of the Funds to the provisions of laboratories and libraries only, have failed to realize the full scope of the scheme. At the same time their criticism is of value as showing how at the commencement we might start by bringing out a few specialists and attach to them select students, and gradually expand our organization as more funds become available.

6. The fifth head relates to the query whether qualified students in proper numbers will join. Of the gentlemen consulted 47 have given their opinions on this point, and the proportion of those who think that there will be no difficulty to those who apprehend that many will not join is as to 2 to 1, and even this minority admits that if some scholarships are provided there will be no difficulty. Of course in the case of poor students the provision of scholarship will be necessary, but the experiments made in Bombay by Dr. Bahadurji and others in the way of post-graduate instruction warrants the hope that there will be no lack of students who will join the new classes from a desire to learn. The minority of the opinions noted above is made up chiefly of officers in the more backward Provinces and Native States. Their hesitation can thus be easily explained. The numbers can not be in the nature of things very large, but when the University is to be opened to select men from all Provinces, there should be no difficulty on this head.

7. The next point relates to the probability of finding employment for graduates trained in the University. 37 Officers have given their opinions on this point, of whom 27 apprehend no difficulty, and 7 think there will be difficulties. Of course, the Government, Native States, Municipalities, &c., will have to show a sympathetic attitude, but there is no reason why they should not do so. With a

development of our industries, these trained men must be in general request, and if Government and Native States can get good men on the spot, sooner or later, these men will naturally have the preference.

8. In regard to the constitution, there is a general agreement that it is, so far as it goes, a good tentative scheme which might be improved with further experience. Minor suggestions are made which will be found useful by the Committee.*

9. The seventh head related to the additional subjects suggested; the suggestions are very valuable, but those who make them must be themselves aware that the number of chairs is limited by the funds available, and if the Committee has limited the chairs to a few subjects, it should not be supposed that they have over-looked the claims of other subjects. They have chosen representative subjects which have the largest relations to the development of our country's resources and the scientific training of our best men. Two of the opinions from Bengal are very suggestive in this respect.

10. The eighth head relates to miscellaneous suggestions, which call for no special remark.

11. The ninth head sets forth what, in the opinion of the authorities consulted, are the advantages and disadvantages expected from the new University. Out of 34 officers who have noticed this point, a bare majority of 18 welcome the University as opening a new era in our educational advance; against them must be set 16 others who think that it will do some injury to the existing Universities by dwarfing their growth and the object also because it will substitute a less efficient agency for the more liberal influences of residence in European Universities for the purposes of post-graduate instruction. With regard to the latter objection, it seems to be forgotten that the scheme proposes to send select men to Europe and America to complete their studies. It is evident that if men are sent out after careful selection and training, they will turn their stay in England to better account and at less cost. With regard to the first objection the apprehension seems groundless as the scheme of the new University takes the students up at the stage where the existing

* See under "Suggestions" (page 37.)

Universities leave them to themselves. The misgivings felt by some appear to be due to want of full acquaintance with the history of the subject, and the advance which the country has already made.

12. The tenth head brings together the directions in the way of advice, given by those who wish well to the scheme. The advice is of caution and slow progress before embarking on a large expenditure. The necessity of slow progress is enforced by the novelty of the experiment and the limits of our resources. This advice will be welcomed by the Committee. The conflict between the advocates of research pure and simple and of a post-graduate teaching University joined with research is reproduced here, and needs no further remark.

13. The last head brings together the views of the gentlemen consulted as to the likelihood of securing support to the scheme. Out of 29 gentlemen, who have given their opinions, 20 think that Native States and the wealthier classes will come forward to support the scheme by endowing scholarships, fellowships, or chairs. The minority of 9 think that the chances of such support are small. This minority however includes the residents of Cashmere, Indore, and the Chief Minister of Jeypore and the Educational Minister of Gwalior. On the other hand, Her Highness the Maharani Regent of Mysore has expressed her cordial approval, and the Dewan's views are too well-known to need repetition here. Mr. Tait, Principal, Baroda College, holds out a hope of munificent support from His Highness the Maharaja, and the Dewan of Gondal and the Revenue Minister of Bhavnagar think Native States will come to the help of the institution. The late D. P. I. of Berar expresses himself strongly in favour of Provincial help to the new University. A nobleman of Jeypore thinks Native States will contribute if Government shows its sympathy and lends its moral and financial support. The Principal, St. John's College, thinks if the Lieut.-Governor lends support Native States will help. These opinions reflect public feeling correctly on this point. The success of the scheme depends upon the attitude of the Government of India and of the local Governments towards it. If these Governments show full sympathy, the rulers of Native States will not be backward, as has been exemplified on many previous occasions, notably in connection with Lady Dufferin's scheme. Without such support no start can be made.

Suggestions.

The following Synopsis brings together suggestions on various points gleaned from the opinions of 76 experts, &c., on the Scheme.

The Senate is considered entirely a superfluous body ; its functions of financial supervision would be better discharged by a Board of carefully chosen Trustees. If it is to be retained, its functions should be rigidly non-academical. Too many representatives are allowed to the founder, and too few for the Professors. On the other hand, it is held that the Constitution is too professorial, and that practical men should be introduced both on the Senate, and on the Professorial Council.

(a) Constitution.

The numbers of the Senate are said to be inconveniently large for practical work and reduction is suggested by giving less representation to Indian Universities and benefactors.

It is also thought that it would be difficult to bring together a large body of men even for one annual meeting from different parts of India, and it is suggested that a local executive body should be formed to supervise administration and that there should be a Principal of the University.

Provision should be made for voting by proxy at Senate meetings.

There should be some direct representation given to the Universities of Oxford and Cambridge.

Assistant Professors should sit in the professors' Council, and the Senate should have no representation on the Council. The question of the dismissal of Professors should be referred to the Appointing Committee in London.

The functions assigned to the Council of Graduates are judged to be both vague and trivial ; and it is suggested that a board or Studies should be created, on which Graduates might have seats, of that the Graduates might receive representation on the Senate. But on the other hand the Council of Graduates is welcomed as the proper medium of communication between Professors and students.

Article 8 of the Indenture would invest the Scheme with an undesirably sectarian character.

Attention has been called to the omission of many subjects, e.g.,

(b) Scheme of Studies. Botany, Biology, Astronomy, Forestry, Scientific Agriculture, Mechanical Engineering, Geology,

Mineralogy, Mining and Metallurgy, Comparative Materia Medica, Theories of Diseases and their cures, systems of Medical Practice, Pharmacology, Fisheries, Agricultural, Zoology, English Literature, Logic and Metaphysics, Ethnography and Anthropology, Commercial Economics, History and Economics. Mr. Covernton wishes that a Chair of Indian Languages should be added as soon as possible ; while Professor Fraser points out that a Professor of educational methods would make himself useful by visiting different centres, and delivering lectures ; but he would not separate Ethics and Psychology from the Chair of Educational Methods. It has also been pointed out that Comparative Philology as understood in Europe would be repugnant to Indian students. There should be provision for finishing courses in Law and Engineering, nor should the more intelligent graduates in History, Law or Philosophy be shut out from the benefits of the Institution.

It is recommended that the new University should confer the

(c) Degrees. D. Sc. degree in all departments and should institute a Licentiate of Teaching, as in

Madras. On the other hand, it is recommended that as a purely Research Institute, the new University should not depend on the adventitious help of Scholarships, Fellowships and Degrees. And it is even objected that all theoretical teaching ought to be imparted in the existing Universities before the degree is conferred.

Separate tests are not necessary, it is argued, for admission to the different departments of studies. * There

(d) Qualifications for admission. should be only one test, viz., of graduation in any one Faculty ; and then the choice should

be left to the students and teachers to determine what studies should be pursued. Non-graduates should also, under restrictions, be admitted. It should be possible for men who already held posts but had no sufficiently equipped laboratory at their disposal, to profit by the Institution in the Long Vacations. For the regular students, the highest degrees of existing Universities, such as the B. Sc., and the

M. A. alone should be the admission qualification. Not one of the **B. Sc.** graduates of the Allahabad University would be fit to join an Institution of advanced work at the time of graduating. But it is recommended that it would be expedient to create a Department in the Institute where those who are to go on with research might receive a preliminary training, while others who will go on into life may receive a post-graduate education.

As competition is healthy, the Dholpur Scheme should not be amalgamated with the new Institution ;

(e) **Miscellaneous.** and provision should be made for rewarding Professors who do distinguished research work. Travelling Scholarships should be instituted in subjects which cannot be studied in Laboratories. Hostels should be erected for the residence of students. Spirituality is a factor not to be neglected ; and perhaps its presence would be best ensured by amalgamation with the central Hindu College, Benares. The salaries of the Professors are put down too low, particularly of the Assistant Professors. The estimates for the Laboratories too low. As the efficiency of the University will depend on the quality of the Professors, it would be expedient to make their posts attractive to the Professors by selecting a good climate for the habitation of the University, and by granting them long vacations as in Europe. The efficiency of the University will depend even more on the students, the best students ought to be captured by an offer of Fellowships tenable for five years under suitable conditions.

A considerable body of opinion in hand has expressed doubt

(f) **Alternatives to the Scheme.** whether the money to be disposed of by the Committee would not be laid out more advantageously if we travelled outside the ideas favoured by the Provisional Scheme. The alternative ideas are collected here for convenience :—

It is said that the time has not yet come for post-graduate instruction ; and that commencement should be made by developing industrial education at the *base* and not at the *top*, for which we can well wait for 50 years more. This view, however, is combated by Mr. Theodore Beck, who says : “ There is a current notion in India that an industrial education consists of a superficial instruction in Chemistry and Physics, and that students who have acquired this may

be expected to acquire great fortunes as the pioneers of manufacture and commerce. I do not know who originated this idea, nor on what facts this rests. But when one remembers the contemptuous ignorance of science that characterises the prosperous commercial classes in England, and the indigence of men of science, as well as the wide divergence in ideals, methods and training of these two classes, it seems legitimate to ask for a proof of the theory." And Professor Ward also thinks that Mr. Tata is wise to recognise that "education spreads from above downwards." Nevertheless the suggestion is persistent for the establishment of Schools of Art and Technical Schools all over the country; it has been urged that the pressing need of India is to practically utilise scientific discoveries already made, and sometimes the idea is put forward that students should be sent to Europe and America to learn, on payment of premium, special industrial processes. And Captain Colvin thinks that the very classes whom Mr. Tata wishes to benefit would be better served if *practical education* were combined with the usual instruction of the classes preparing for degrees. Other suggestions, however, distinctly recognise the need of post-graduate education for Indian students, but some of them assume that it is already available and being availed of in the European Universities; and that all that is necessary, at least for the present, is to give encouragement by the foundation of hostels, and perhaps stipends also. It would be a great pity, it is said, if the broadening influences of residence in Europe came to be neglected. Statements, however, appear which show the need of caution. Professor Ward calls attention to the State Scholarship and Gilchrist Scholarships which are often rejected by able natives, who from family and other reasons cannot leave India. Mr. Tata had just had a similar experience personally. Again, twice we are reminded that if such Scholarships are awarded, in some way care should be taken that they are not made a convenience of by men who wish to compete for the I. C. S. or qualify for the bar. And we are warned that the present backwardness in India in original production is due chiefly to the absence of local facilities of Libraries and Laboratories; and this defect of existing facilities and the need of providing them at least centrally somewhere in India is incidentally pressed upon us in the suggestions that work in the Institute should be open to others besides regular students, even men who hold posts but have no

Laboratories or appliances at their disposal.* Indeed, it is urged that Government would do well to send to the new Institute, on full pay as in Germany, men who are already doing teaching work, but can produce no new knowledge for want of appliances where they are stationed. Dr. Ray, however, is convinced that the want is not of appliances and Laboratories, and directing Professors, but of a commercial demand for scientific qualifications, and in the absence of such demand, of Research Fellowships in connection with a whole number of efficient institutions whose successful work he fully describes. A different view comes into evidence with the proposition that "greater help would be accorded to education in its most advanced stages if additional Professorships were founded in connexion with existing Colleges all of which are insufficiently equipped in this particular." But Mr. Ward thinks that the teaching power is fairly efficient, and is increasing, and that it would be best to leave the existing Universities to work out their own salvation, and establish a post-graduate institution of pure research without the power of granting degrees. The idea of a Research Institute, pure and simple, has been presented by the Hon'ble Mr. Justice Gurudas Bannerji, Mr. Theodore Beck, Dr. Jackson, by Principal Brown, M. D., and by Col. Clibbom. There is, however, some considerable variance among these gentlemen as to details. Mr. Ward strongly opposes the conjunction of the Medical Branch with physics and Chemistry, "as there is little or no connexion between Physical and Physiological Laboratories, and there are already some good schools in the country to which Physiological and Pathological Laboratories are attached." Mr. Ward would also wait for the Technical to gradually evolve itself out of the Pure Sciences. The Professors of the College of Science, Poona, would also begin with the Scientific Branch, but they would emphasise the Technological side, to which other subjects should lead up; they would postpone the Medical for the present, because Medical Research is already fostered, and has made a beginning, and because "both electricity and chemistry are very intimately connected with Medical Science, and their study in general is a direct

* Now should we omit to notice that according to Dr. Brown and to Mr. Theodore Beck the leading function of our Institute will be to help to solve distinctively Indian problems now awaiting investigation -- the Scientific and Medical problems as well as those arising from the more perishable material of Indian Anthropology or Indian Economics. This function, obviously, would have to wait if the Tata Endowment were converted into a fund for Scholarships tenable in Europe.

aid to progress in that branch." The Principal of Roorkee in view of the present condition of India, would begin with Medical Research; "qualified officers for investigations in this department are ready to hand, and all that appears necessary is to *combine existing centres in one suitable locality.*" And, in discussing what that locality should be, Col. Clibbom expressly maintains the advantages of the neighbourhood of the Thomasson College. No. 63 strongly urges that the best application of the funds at the disposal of the Committee would be to the creation of an Institute for original research; sketches a detailed scheme very much like Mr. Ward's; but is of the opinion that "if Government could be prevailed on to associate therewith the proposed Institution for Bacteriological Research which has been so long under its consideration, there is every reason to hope that the work carried out in an Institute of this kind would lead to results which would confer credit on India and its inhabitants."*

Father Kemp, after an able criticism of the Committee's Scheme concludes that Agricultural and Technological Chemistry are subjects which, under competent Professors, may be expected to prove of the greatest material advantage to India. But for efficiently conducting an advanced course in these subjects, a yearly expenditure on the staff alone, amounting to 2 lacs of rupees, would be barely sufficient and as the call for high class education in Agriculture is not pressing since there are the Government Agricultural Colleges, Chemical Technology ought to have the first claim on the funds of the new University, because at present there exists no opportunity of studying the subject in India. Another plan, also aiming at technological research, which is declared to be impossible in a central Institution, combines local activity with central supervision. It advocates the creation of a central body like the Science and Art Department of London, now under revision or in process of disestablishment. This body would control a system of museums, promote among them exchanges of industrial products, work in conjunction with local Universities and Laboratories, and promote the highest

* Compare Mr. Sharp's statement "that if the object is *original research*, the money would be better spent in endowing handsomely some few posts for original research, to be held by men of the highest promise"...and again "The most practically useful department would seem to be the Medical, for a trained specialist can always find employment, when his reputation is established for any particular group of ailments; and the prosecution of original research is by no means inconsistent with the maintenance of private practice."

scientific training by a system of Peripatetic Teachers who would, like the University Extension Lecturers, visit the localities where they most were needed. A different proposal looks to Java for a model to begin with. "A number of experts, with European or American experience, might carry on the work of Research and original work in various departments, and be *assisted* in their labours by *Pupil Assistants*, who, if the necessity arises, might later on become a nucleus of students and gradually raise the Institution to become a Teaching University." Mr. Theodore Beck takes a line of his own; and boldly asserts that if Research be the aim, then the Philosophical Division is the one most fit to be cultivated in India, where special opportunities exist in these subjects; the duty of attending to perishable knowledge is upheld; and the advantage to Indian education from the preparation of text-books on Indian History and Indian Economics such as would result from the researches on those subjects in a well-equipped University is pointed out. Similar views have been verbally communicated to the Honorary Secretary by Principal Thiebaut (Allahabad) and Principal Stein (Lahore). But Principal White, again, insists on the expensiveness of Scientific Research, from which he infers the expediency of limiting Research to natural science in all departments, particularly as a good Library is all that would be needed for researches in subjects like History. Mr. Covernton inclines to the opinion that a Teaching University really deserving of the name whether modelled on the English or the German system would be of more general advantage to the Natives of India than an Institute for the manufacture of second-rate specialists. In Bombay and similar Indian Universities, "the work required for the B. A. is of an absurdly low standard, and even in the M. A. the quality of the performance leaves much to be desired. On the other hand, the existence of a genuine University would re-act on the local bodies and tend to improve them, so that in time an adequate number of well-grounded students might be forthcoming. This improvement would probably manifest itself soonest in the non-scientific subjects which, as a whole, are more suited to the peculiar bent of the Indian intellect." A similar opinion has been sent by Principal Davies, who would subordinate research to the functions of a Teaching University, and thinks that the Philosophical Department offers a good field for the new University to make itself useful in promoting scientific secondary education in the country.

“ In 1870 The Council of The Institution of Civil Engineers issued a volume entitled “The Education and Status of Civil Engineers in the United Kingdom and in Foreign Countries ;” but since that time, this subject of Engineering Education has acquired much increased importance in consequence of the great success and large extension of the Student Class, and the consequent larger demand for preliminary education for the profession.

The Council felt it their duty to draw up, with much care and consideration, a set of Regulations for the Admission of persons into this class, and as these have been found, by experience, to work well, they are now republished for general circulation.

The Regulations have expressly had reference to a preliminary course of education. The work of 1870 contained information as to the Educational Institutions in Great Britain and Ireland, where instruction was given bearing on the profession of Civil Engineering; but during the time that has elapsed since that date, the number of these Institutions has so much increased that it is now necessary to issue an amended list, which is given in Appendix A. Further details may be obtained by applying to the Institutions themselves.

In Appendix B are added some remarks on the general subject, which are considered worthy of attention.

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APPENDIX A.

PARTICULARS OF EDUCATIONAL INSTITUTIONS IN THE BRITISH DOMINIONS WHERE INSTRUCTION IS GIVEN BEARING ON THE PROFESSION OF CIVIL ENGINEERING.

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**REGULATIONS OF THE COUNCIL AS TO THE
PRELIMINARY EDUCATION OF CANDIDATES
SEEKING ADMISSION AS STUDENTS.**

1. On and after June 1, 1889, no person shall be admitted as a Student unless he shall produce evidence of a competent knowledge of the subjects of General Education specified in the following List :—

- (1) English Grammar and Composition ;
- (2) Elements of Mathematics, comprising (a) Arithmetic, including Vulgar and Decimal Fractions, (b) Algebra, including Quadratic Equations, with one unknown quantity, (c) Geometry, including the first three books of Euclid, with easy questions on the subject-matter of the same ;
- (3) Elementary Mechanics of Solids and Fluids, comprising the Elements of Statics, Dynamics, and Hydrostatics.
- (4) Two of the following optional subjects :—
 - (a) Latin, (b) Greek, (c) French, German, Italian, or any other Modern Language, (d) Logic, (e) Chemistry, Geology, Botany, or any other branch of Physical Science.

2. The evidence required in the above regulation shall be furnished by Certificates to show either—

- (a) That the Candidate has obtained any one of the Educational Distinctions named in Schedule No. I. ; or
- (b) That the Candidate has attended classes in any of the Public Educational Establishments, mentioned in Appendix A, on any of the qualifying subjects, and has acquired a competent knowledge of the same ; or
- (c) That the Candidate has passed one or more examinations, in any of the qualifying subjects, by any of the recognized Public Examining Bodies mentioned in Schedule No. II.

The Certificates mentioned in (b) and (c) must, in the aggregate, include all the qualifying subjects named in Regulation No. I.

3. The Council may from time to time extend, alter, or otherwise amend the Schedules Nos. I. and II., and Appendix A.

4. The Council reserve to themselves power to accept special qualifications of practical work in lieu of certain educational qualifications ; or to waive any of the above-named requirements under special circumstances as they may think advisable.

SCHEDULE No. I.

EDUCATIONAL DISTINCTIONS WHICH OF THEMSELVES IMPLY SUFFICIENT QUALIFICATION.

- Any degree in Arts, or Science, or Engineering, in any University in the British Empire.
 Matriculation in the University of London.
 Matriculation in the Engineering Department of King's College, London.
 Matriculation in the Engineering Department of University College, London.
 Matriculation in the Central Institution of the City and Guilds of London Technical Institute.
 Election as a "Whitworth Scholar."

SCHEDULE No. II.

LIST OF PUBLIC EXAMINING BODIES AND EXAMINATIONS RECOGNIZED BY THE COUNCIL.

- UNIVERSITY OF OXFORD:—**
 Moderations.
 Responsions.
 Senior and Junior Local.
- UNIVERSITY OF CAMBRIDGE:—**
 Previous Examination.
 Higher, Senior and Junior Local.
- OXFORD AND CAMBRIDGE SCHOOLS' EXAMINATION BOARD:—**
 Higher and Lower Certificates.
- UNIVERSITY OF DURHAM:—**
 Examination for Certificate of Proficiency.
 Examination for Students at the end of their first year.
- VICTORIA UNIVERSITY:—**
 Preliminary Examination.
- UNIVERSITY OF EDINBURGH:—**
 Preliminary Examination for Graduation in Science.
 Senior and Junior Local.
- UNIVERSITY OF ABERDEEN:—**
 Senior and Junior Local.
- UNIVERSITY OF GLASGOW:—**
 Senior and Junior Local.
- UNIVERSITY OF St. Andrew's:—**
 Senior and Junior Local.
 Scotch Education Department Leaving Certificate.
- UNIVERSITY OF DUBLIN:—**
 General Examination at end of Senior Freshman year.
 Public Entrance Examination.

ROYAL UNIVERSITY OF IRELAND :—
Matriculation Examination.

QUEEN'S COLLEGE, BELFAST :—
Matriculation Examination.

QUEEN'S COLLEGE, CORK :—
Matriculation Examination.

QUEEN'S COLLEGE, GALWAY :—
Matriculation Examination.

INTERMEDIATE EDUCATION BOARD OF IRELAND :—
Senior, Middle and Junior.

ST. DAVID'S COLLEGE, LAMPETER :—
Responsions Examination.

COLLEGE OF PRECEPTORS :—
Examinations for First Class Certificate, or Second Class Certificate of
First or Second Division.

THE SCIENCE AND ART DEPARTMENT'S EXAMINATIONS.

INDIAN AND COLONIAL UNIVERSITIES AND COLLEGES.

UNIVERSITY OF CALCUTTA :—
Entrance Examination.

UNIVERSITY OF MADRAS :—
Entrance Examination.

UNIVERSITY OF BOMBAY :—
Entrance Examination.

UNIVERSITY OF MCGILL COLLEGE, MONTREAL :—
Matriculation Examination.

UNIVERSITY OF BISHOP'S COLLEGE, MONTREAL :—
Matriculation Examination.

UNIVERSITY OF TORONTO :—
Matriculation Examination.

UNIVERSITY OF TRINITY COLLEGE, TORONTO :—
Matriculation Examination.

UNIVERSITY OF QUEEN'S COLLEGE, KINGSTON, CANADA :—
Matriculation Examination.

UNIVERSITY OF VICTORIA COLLEGE, UPPER CANADA :—
Matriculation Examination.

UNIVERSITY OF MANITOBA :—
Previous Examination.

UNIVERSITY OF FREDERICTON, NEW BRUNSWICK :—
Matriculation Examination.

UNIVERSITY OF KING'S COLLEGE, NOVA SCOTIA :—
Responsions.
Matriculation Examination.

UNIVERSITY OF HALIFAX, NOVA SCOTIA :—
Matriculation Examination.

DALHOUSIE COLLEGE AND UNIVERSITY, HALIFAX, NOVA SCOTIA :—
Matriculation and Sessional Examinations.

UNIVERSITY OF MELBOURNE :—

Matriculation Examination.

UNIVERSITY OF SYDNEY :—

Matriculation Examination.

UNIVERSITY OF ADELAIDE :—

Matriculation Examination.

TASMANIAN COUNCIL OF EDUCATION :—

* Examination for the Degree of Associate of Arts.

UNIVERSITY OF THE CAPE OF GOOD HOPE :—

Examination for a Degree in Arts.

Matriculation Examination.

UNIVERSITY OF OTAGO :—

Preliminary Examination.

UNIVERSITY OF NEW ZEALAND :—

Entrance Examination.

CHRIST'S COLLEGE, CANTERBURY, NEW ZEALAND :—

Voluntary Examinations.

CODRINGTON COLLEGE, BARBADOS :—

English Examination for Students of two years' standing.

APPENDIX A.

PARTICULARS OF EDUCATIONAL ESTABLISHMENTS IN THE BRITISH DOMINIONS WHERE IN- STRUCTION IS GIVEN BEARING ON THE PRO- FESSION OF CIVIL ENGINEERING.

METROPOLITAN.

UNIVERSITY COLLEGE, LONDON.

This College, founded in 1828 as the "University of London," and subsequently incorporated by Royal Charter under its present title, is one of those in which the scientific education bearing on Engineering has been most fully studied and provided for.

It has three Faculties, devoted respectively to *Arts and Laws*, to *Science*, and to *Medicine*. It is only with the second of these that we have here to do.

The general scientific curricula comprehend—

Mathematics, in all grades and forms.
Applied Mathematics and Mechanics.
Physics, theoretical and experimental.
Chemistry, theoretical and experimental.
Geology and Mineralogy.
Botany.
Zoology.

As well as Physiology, Comparative Anatomy, Political Economy, the Philosophy of Mind, Logic, &c.

Included in this Faculty also, is a special department, called

APPLIED SCIENCE AND TECHNOLOGY.

This department is intended to provide for students wishing to devote themselves to Engineering, Architecture, Applied Chemistry in any of its branches, and any other manufacturing or commercial pursuit, requiring a systematic training in the application of scientific principles to industrial purposes.

As in all other departments of this College, there is an unrestricted admission of students, without previous examination, to any class or classes they may select.

Curricula have been arranged for the different objects, so as to give the greatest opportunity of benefit to the student, and if he has sufficient time at his disposal, it is in most cases advisable that one or other of these should be attended.

The Engineering Branch.

The following remarks are placed at the head of the Syllabus in the College Calendar, and they are important, to prevent misunderstanding as to the scope of the instruction given—

This Department includes Lectures, Drawing Classes, and Practical Work, the details of which are given below.

It should be understood, however, that none of this work can render unnecessary a pupilage, or its equivalent, in the actual practice of the profession. Such a pupilage is the only available means by which a student can obtain a sufficiently thorough knowledge of the practical details of his future work.

But the training given in the College will be found to be of value not only directly, but also by enabling those who have gone through it to take fuller advantage of the opportunities afforded during a professional pupilage.

The complete curricula for a student intending to become an Engineer, usually extend over three sessions. For the convenience of those who are unable to devote more than two sessions to their College work, an alternative curriculum, extending over two sessions, is also arranged. A very large number of students, under this plan, spend only two years at the College. In some instances a year of apprenticeship is taken between the two years of College work, the remainder of the apprenticeship coming after the second year.

The curricula include not only instruction in Applied Science, but also such preliminary instruction in Pure Science (especially in Mathematics, Physics, and Chemistry), as a student ought to have before proceeding to study its applications. The study of modern languages is not included in any of them; but a remark is made that their importance to the student is exceedingly great, and that, therefore, it may be often advisable that some time should be given to them.

The principal classes comprised in the complete course are described as follows :—

FIRST YEAR.

Mathematics, Junior.
Graphics, Junior.
Mechanics.
Surveying.

Experimental Physics.
Graphics, Drawing.
Economic Geology.

GREAT BRITAIN.

SECOND YEAR.

Engineering, Junior.
Machine Design and Drawing, Junior.
Mathematics, Senior.
Graphics, Senior.
Practical Physics.
Electrical Technology.
Chemistry.

THIRD YEAR.

Engineering, Senior.
- Machine Designs and Drawing, Senior.
Engineering Laboratory.
Mathematics, Senior.
Physics, Senior.
Civil Engineering, or Electrical Technology.

The Junior Engineering Class comprises the manufacture of iron and steel ; the strength of materials and simple structures ; the theory of machines ; and the elementary theory of the steam-engine and boiler.

The Senior Class treats of the kinetics of machinery ; friction and efficiency ; advanced theory of the steam-engine ; air- and gas-engines ; dynamometers and brakes ; the testing of engines ; marine engineering, the propulsion and resistances of vessels ; locomotives, simple and compound.

The Drawing Classes form, as far as possible, a progressive²³ course of Engineering Design, in which the students apply practically the instruction they receive. They include working-drawings of detailed parts ; the graphic delineation of stresses, and ultimately the complete design of simple structures and machines.

The Engineering Laboratory, established in 1878, is a special feature in this College, and is thus described—

It is intended to provide systematic instruction to Students and young Engineers in the experimental methods which serve for determining the numerical data employed in engineering calculations, and also for familiarizing them with the strength and other physical properties of the chief materials used in construction.

The importance of such instruction is twofold. In the first place, the exact value of any numerical results derived from experiment, and the limits within which they may be safely trusted, can be rightly estimated only by those who have some practical and personal acquaintance with experimental processes of the kind employed in obtaining these results. In the second place, engineers are continually called on to deal with questions in regard to which some essential data are altogether wanting, and they are therefore very often compelled to make special experiments for their own guidance. It is obvious, however, that in such cases the probability of their obtaining accurate and trustworthy results will be

much greater if their previous training has made them practically acquainted with the art of experimenting and with the methods that had been successfully adopted by others in dealing with analogous questions.

The practical training given in the Engineering Laboratories is also specially arranged to give Students as intimate an acquaintance as possible with the working of engines under widely-differing conditions, economical and uneconomical, and generally with the manner in which experiments in matters relating to engineering science are carried on.

The Laboratory contains testing-machines of various kinds and powers; a steam-engine and a gas-engine, both fitted for testing purposes, and the machine-tools necessary for the making of apparatus, &c.

The Constructive Engineering Classes comprise—

- Railways, their design, construction, and working, and the details of all their provisions and apparatus.
- Roads and Tramways.
- Rivers, Canals, Docks, and Harbours.
- Water, Gas, and Sewage works, &c.

Visits to engineering works in or near London, are arranged from time to time.

Surveying Classes with practical field-work are held in the summer term.

The Electrical Technology Class comprises:—

- The Elements of the Theory of Dynamos of various types.
- Principles of Electric Light Installation.
- Electric Motors, &c.

A Certificate of Matriculation is given by examination, at entrance, or after a certain portion of the course; and this is followed by a General Certificate of Engineering after more mature progress, which is endorsed for Honours in cases of special merit.

Two scholarships are given annually on the result of class examinations.

KING'S COLLEGE, LONDON.

This College was established by Royal Charter in 1829, as: "A College in which instruction in the doctrines and duties of Christianity, as taught by the Church of England, should be for ever combined with other branches of useful education."

The instruction is conducted "in twelve distinct but mutually related Departments"; namely—

- The Theological Department.
- The Department of General Literature.

The Department of Science.
 The Department of Engineering and Applied Sciences.
 The Medical Department.
 The Department of Public Health.
 The Department for Ladies.
 The Evening Classes.
 Technical Instruction.
 The School of Art.
 The Civil Service Department.
 The School.

Students who attend the full prescribed course of study in their respective departments, are termed *Matriculated Students*, and are subject to certain general rules. But there is no Matriculation Examination, and entrance, either to the full courses or to portions of them, is open to all.

The Science Department comprises all the usual subjects.

The DEPARTMENT of ENGINEERING and APPLIED SCIENCES, has for its professed object to provide a system of general education of a practical character for young men who are to be engaged in professional employments, such as Surveying and Civil Engineering, Telegraphy, Building Construction and Architecture, Mechanical Engineering and the higher branches of Manufacturing Art, or in commercial and agricultural pursuits, or who wish to prepare for the Whitworth Scholarship Examination, or for entrance into the Engineering Department of the Royal Navy, or for Civil Engineering Appointments in India.

The ordinary engineering course occupies three years, and forms an appropriate introduction to that kind of instruction which can only be obtained within the walls of the manufactory, or by actually taking part in the labours of the surveyor, the engineer, or the architect.

Museums, containing mechanical and physical apparatus, chemical and industrial products, valuable collections of models and specimens, &c., illustrating the subjects taught, are open to the students.

A Testing machine (given by the Clothworkers Company) is employed for instructing the Students in the strength of materials used in engineering and architectural structures.

The following are the subjects of the different Lectures given in this department :

Divinity.
 Mathematics.
 Natural Philosophy (mechanics and physics, and physical laboratory).
 Architecture and Building Construction.
 Mechanical Engineering and the Workshop.

Civil Engineering.
 Drawing (geometrical, architectural, and engineering).
 Chemistry (theoretical, practical, and analytical).
 Mineralogy.
 Geology.
 Photography.
 Electrical Engineering.
 Metallurgy.
 The Workshop.

The course on *Mechanical Engineering* extends over three years.

During the first and second years the lectures deal with the methods of measurement, the mechanics of machinery, and the strength of materials; tension, compression, bending, shear, torsion, simple structures, riveted joints, alternating, repeated, and sudden loads. Theory of machines and analysis of mechanisms, including the theory of the steam-engine and boiler simply treated.

Occasional demonstrations will be given on the twenty-five-ton testing machine.

In the third year the students proceed to the more advanced study of the theory of the steam-engine and boiler, heat-engines in general, hot-air and gas-engines. Friction and efficiency of machines, with the methods of testing them. Valves and valve-gears, governors, twisting-moment in crank shafts, theory of propulsion and the resistance of ships, and screw-propellers. Other special subjects will be treated according to the requirements of students.

Engineering Laboratory and Workshops.—The workshop course for first-year students is so arranged as to give a preliminary knowledge of the use of tools, methods of adjustment, limits of accuracy obtainable in practice, &c.

In the second year students begin upon experimental work in the engineering laboratory. While in the machine shop they will be for the most part engaged in making and preparing apparatus and test specimens for their future use in the laboratory.

The course on *Civil Engineering* also extends over three years, as follows:—

During the first year:—The application of practical geometry to the purposes of a surveyor and engineer; surveying instruments, surveying of different kinds and by different methods, levelling, plan drawing, flying levels for roads, railways, and other works, with observations as to geology, strata, streams, springs, subsoil, &c., plotting sections and cross sections.

The practical instruction in the field consists in carrying out a chain survey explanatory of the usual difficulties that are met

with in practice. The various instruments which have been described in the lectures are used in the field.

During the second year the course deals both in the lecture room and in the field with extended surveying operations. Surveys of towns by theodolite, surveys for railways, roads, canals, &c., plane trigonometry applied to surveying purposes, spherical excess, trigonometrical determination of heights and distances, measuring distances from a primary base, taking out quantities of cuttings and embankments, setting out curves, contour levelling, trial levels for roads, railways and other works, and the observations to be recorded as to strata, streams, springs, woods, &c.

In the third year the course deals both in the lecture room and in the field with surveying in its application to the various branches of civil engineering practice, and includes setting out work, selecting routes for roads and railways, contouring and laying out land for building, irrigation, and other purposes, dialling for mining operations, tunnelling, measuring and observing currents, hydraulic surveying, bridges, calculation of strains, railways, tramways, land reclamation, foreshore protection, land draining, sewerage of towns and villages, water supply, floods prevention, improving navigable channels, training walls, docks, harbours, and piers.

The students of this year accompany the Professor to inspect various works in course of execution in the Metropolis.

Building Construction and Architecture:—This course is intended to furnish to second-year students a knowledge of the elementary practice of building construction and architecture, and of the application of the principles of mechanics to construction.

A short course of lectures is also given upon architectural design and history of the art.

Electrical Engineering:—After two years passed in the engineering department of the college in obtaining the general training that is necessary to enable students to successfully follow electrical engineering, they are admitted to the special course of lectures and laboratory work.

The laboratory will be open throughout the week for advanced students, whose preparation must qualify them for conducting original researches under advice and direction of the Professor.

The laboratory contains steam-engine and boiler, direct and alternate current dynamos of latest design, large resistances, and is thoroughly equipped with instruments of newest construction. It is fitted with a large set of accumulators, and students are enabled to study every branch of electrical engineering.

The prizes and certificates given in this subject depend partly on a written, and partly on a practical examination, and the syllabus for the course is as follows:—

Construction and use of standard cells.

Ballistic galvanometer.

Quantitative experiments on the magnetic qualities of iron, and electromagnetic induction.

Dynamo and motor design, electrical and mechanical.

The direct current machine, as motor and generator.

The alternate current machine, as motor and generator.

Electrometer.

Dynamometer and brake experiments.

Wattmeters.

Arc lamps, projectors.

Efficiency tests with boiler, steam-engine, and dynamos.

Transformers.

Voltmeters.

Electrical measurements.

Details of installation work, leads, switchboard, fuses, &c.

Central stations.

Underground and overhead cables.

Accumulators.

THE ROYAL COLLEGE OF SCIENCE, LONDON, WITH WHICH IS INCORPORATED THE SCHOOL OF MINES.

Although this institution does not profess to give special instruction directly in Engineering, yet the classes contain so many subjects bearing upon it that they may fairly be noticed as elements of Engineering Education.

The Royal College of Science at South Kensington is supported by the State to supply systematic instruction, in the various branches of Physical Science, to students of all classes. The instruction is arranged in such a manner as to give the students a thorough training in the general principles of science, followed by advanced instruction in one or more special branches.

The Royal School of Mines has a more special interest to Engineers. It is incorporated with the Royal College of Science, and Mining Students obtain their general scientific training in the latter-named establishment; but separate Classes are formed especially for the subjects more intimately bearing on Mining operations.

The prospectus of this latter establishment contains the following statement:—

The principal object of the Institution is to discipline the students thoroughly in the principles of those sciences upon which the operations of the miner and metallurgist depend. Of course nothing but experience in the mine and in the laboratory can confer the skill and tact requisite for the practical conduct of these operations; but, on the other hand, it is only by an acquaintance with scientific principles that the beginner can profit by that experience, and improve upon the processes of his predecessors.

The Science College gives general instruction, by Lectures and Laboratory work, in—

Mathematics.
 Mechanics.
 Physics.
 Chemistry.
 Astronomy.
 Zoology.
 Botany.
 Drawing.
 Mine Surveying.
 Agricultural Science.
 Geology.

The Mining branch adds theoretical and practical instruction in—

Determinative Mineralogy.
 Metallurgy.
 Assaying.
 Mining operations.

Examinations are held, and an Associateship is granted on proper qualification, as are also many Exhibitions, Scholarships, Medals, and Prizes.

THE CITY AND GUILDS OF LONDON INSTITUTE FOR THE ADVANCEMENT OF TECHNICAL EDUCATION.

This Institution is so important, in its educational character, and so extensive in its scope, that a brief account of its origin and development will not be out of place here.

Some thirteen or fourteen years ago, certain of the Livery Companies of London, recognizing the altered conditions of apprenticeship, were moved by the desire to devote a part of the funds which had been bequeathed to them, and which had accumulated in their hands, to the general improvement, by means of technical education, of the industries of the country, or of the special trades with which they severally were associated.

Many of the Companies separately had previously, by means of occasional lectures, by prizes, by exhibitions, and by other agencies, endeavoured to promote the interests of their several trades; but it was generally felt that these isolated efforts of individual companies, although productive of some good results, were not calculated to exert that beneficial influence on the education of the industrial classes of the country which might follow from their united action.

Accordingly, some time before the question of technical education was as prominently before the public as it now is, a suggestion was thrown out that the Livery Companies of London might do well to combine for the purpose of developing a general scheme of technical instruction, adapted to the requirements of all classes of persons engaged in productive industry.

This idea took practical shape at the beginning of 1877, when, at a meeting of the representatives of several of the principal Companies, a Committee was formed for the purpose of preparing a scheme for a national system of Technical Education.

The Committee placed themselves at once in communication with a number of gentlemen distinguished for their scientific ability, as well as for their knowledge of the educational wants and requirements of the industrial classes of the country, and obtained from them a set of valuable reports on the best means of giving effect to their object. These having been duly considered, the Committee prepared the outlines of a scheme, which they submitted to the representatives of the several Livery Companies who had joined the Association.

This scheme provided for the foundation in London of a Central Institution for higher Technical Instruction; for the establishment of, or for assistance to, trade schools; for the conduct of examinations in technology; and for the subsidizing of other institutions in London or in the provinces, having cognate objects. All these intentions have been amply carried out, and are still in action.

This scheme was approved, and a Provisional Association of the Companies was constituted to commence proceedings. The prospects appeared favourable, and as the work was clearly likely to develop in more than one direction, and to increase in magnitude and importance, in the spring of 1880 the Institute was permanently established and registered under the title given at the head of this description; and shortly afterwards it received an important recognition in the acceptance, by H.R.H. the Prince of Wales, of the Presidency. The Chairmanship of the Council was accepted by the Right Hon. the Earl of Selborne (then Lord Chancellor), and that of the Executive Committee by

Sir Frederick Bramwell, Bart., F.R.S., M. Inst. C.E., who has always been one of the most earnest and active promoters of the movement.

The Royal Commission, appointed in 1881 to inquire into Technical Instruction, stated in their Report, three years later, 'No organization like that of the Science and Art Department, and of the City and Guilds of London Institute, exists in any continental country; and the absence of such organization has been lamented by many competent persons with whom we came in contact.'

The most important feature in this scheme was the establishment of a Central Institution, in which instruction should be given with the general object of pointing out the application of different branches of science to various manufacturing industries. Specially the instruction was to be adapted to the requirements of (1) those who intended to become technical teachers; (2) those who were preparing to enter Engineers' or Architects' offices, or manufacturing works; and (3), those who wished to study the scientific principles underlying the particular branches of industry in which they were engaged. In 1879 the Institute acquired, from Her Majesty's Commissioners of the Exhibition of 1851, the use of a valuable plot of ground; and in July 1881 the foundation of the building was laid by the Prince of Wales. It was opened on the 25th of June, 1884, also by the Prince, who had then graciously accepted the post of President of the Institute.

The Institute has at present two teaching establishments: the one already mentioned, at South Kensington, called the *Central Institution*, and the other, called the *Technical College*, in Finsbury.

CENTRAL INSTITUTION, SOUTH KENSINGTON.

The special object of this Institution is stated to be—

To give to London a college for the higher technical education, in which advanced instruction shall be provided in those kinds of knowledge which bear upon the different branches of industry, whether manufactures or arts.

The main purpose of the instruction given is to point out the application of the different branches of science to various manufacturing industries.

There are three complete courses of instruction specially arranged for students who intend to enter Engineering, Electrical, or Chemical Industries. Students who desire to go through a complete course, and to take the diploma of the Institute, have to pass an entrance or Matriculation examination in Mathe-

atics, Engineering Drawing, Chemistry, and Physics. A complete course of instruction occupies three years, except in the case of students who already possess knowledge enough to join the second year's course. The first year's course is the same for all students, and is intended to give a sound and thorough preparation for the technical studies of the second and third years. A large proportion of time is given to instruction in Mathematics and Mechanics, and in the other departments the instruction is elementary and preparatory to more advanced work. By the end of the first year a student elects to join the Engineering, the Physical, or the Chemical department, with a view of being educated specially as a Civil or Mechanical Engineer, an Electrical Engineer, or a Chemical Engineer; but studies in all four departments continue during the second year. During the third year a student spends the whole of his time in the department he has elected to join, with the exception only that some advanced Mathematical instruction is given to Engineering and Physical students. Besides regular matriculated students, persons who have knowledge enough to follow the instruction are admitted when there is room in the classes to any courses they may select, or to do work in the laboratories.

Department of Mechanics and Mathematics.

The chief object of this course is to give the student a thorough knowledge of those principles of mechanics of which he will make use in Physics or Engineering. A certain amount of pure mathematics is required, and is included in the course. For Engineering or Physical students the course extends over the three years.

<i>First Year</i>	{	Mensuration of Areas and Volumes. Statics and Graphical Statics. Projective Geometry. Perspective. Trigonometry.
<i>Second Year</i>	{	Vector Calculus. Kinematics of a Point. Differential and Integral Calculus. Kinetics. Statics and Hydrostatics. Theory of Equations.
<i>Third Year</i>	{	Higher Geometry. Definite Integrals. Differential Equations. Partial Differential Equations with Applications to Physics. Higher Dynamics. Mathematical Theory of Electricity and Magnetism.

A laboratory of Mechanics is attached to the Mathematical Department, in which students experiment on the laws of dynamics and the determination of physical constants, and are made acquainted with measuring and calculating instruments such as planimeters and integrators. The students also construct various models, illustrating geometrical theorems and models of surfaces which are of importance in practical application.

Engineering Department.

The instruction in this department is divided into: (1.) A course of Lectures on Applied Mechanics, and Descriptive Engineering, with exercises worked in Class. (2.) A Drawing Office course, extending from elementary instruction in drawing to the designing of complete machines and structures. (3.) A Workshop course, in which instruction is given in Carpentry, Chipping and Filing, Smithwork, and the use of Machine Tools. (4.) A Laboratory course, in which experiments are made on the strength of iron, steel, cement, and other materials on a large scale, on the fuel consumption and efficiency of boilers, on the action of steam in a steam-engine in different conditions of working, on hydraulics, and on other subjects interesting to engineers. (5.) A Surveying course, including instruction in the use and adjustment of instruments, plotting, and field work.

During the *First Year* students intending to become Civil or Mechanical Engineers attend only the Workshop and Drawing Office course, the remainder of their time being given to Mathematics, Physics, and Chemistry.

In the *Second Year*, while the subsidiary instruction is continued, they attend Lectures on—

The Kinematics of Machines.
The Dynamics of Machines.
The Strength of Materials.
Hydraulics and Hydraulic Motors.

In the *Third Year*, in addition to advanced Mathematical instruction, the Lecture course embraces—

The Strength and Stability of Structures.
The more advanced parts of the theory of the Resistance of Materials.
The Theory of the Steam-Engine and Gas-Engines.

There are also Lectures on some parts of Descriptive Engineering such as Water Supply, Bridge Construction, Valve Gears, &c.

During this year the students spend one day per week making investigations in the Engineering Laboratory. They also take the course of instruction in Surveying, and they give about one day per week to designing machines and structures.

The workshops are well supplied with machine tools. The Engineering Laboratory, which has been partly described in Professor Kennedy's Paper on Engineering Laboratories, is one of the completest in the country. It is provided with a 100-ton testing-machine, an engine and boiler specially arranged for researches on the action of steam, and many smaller testing machines and measuring and other subsidiary appliances.

The Physical Department.

The Physical department is chiefly devoted to Electrical Technology. Physical students take the same course of instruction in Engineering and Mathematics during the first and second year as Engineering students, and in the third year devote their time chiefly to the applications of Electricity. The course of instruction in Physics consists of Lectures and of practical work in the laboratories. There are three electrical research laboratories; a Dynamo room, and Laboratories for Heat, Optics, Magnetism, and Acoustics. The first year's course of Physics begins with the discussion of the accurate commercial measurement of Electric Currents, Difference of Potential, Resistance, &c. The remainder of the session is taken up with the Laws of Heat, Sound and Light. Laboratory work goes on from the first, concurrently with the Lecture instruction. In the second year, the course of instruction in Electrical Technology embraces the following subjects—

- Laws of Electro-Magnetism and Induction, and their application in Direct and Alternate-Current Dynamos and Motors.
- Governing Dynamos for Constant Current or Potential.
- Designing Dynamos.
- Mechanical Measurement of Power of Dynamos. Efficiency of Dynamos.
- Electric Lamps, Arc and Incandescent.
- Accumulators. Transformers.
- Distribution of Electricity.
- Absolute System of Electrical and Magnetic Units.
- Construction of Submarine Cables.

During the third year the more advanced parts of these subjects are taken up, and the students are encouraged to carry out some original research work. In addition, they test

the power and efficiency of Alternate Current Dynamos and Transformers, design and construct Electrical Apparatus, and Electrical Installations, practise Jointing and Laying of Leads, and the duties likely to be required of them at electrical works. The lecture course includes the designing of Dynamos to produce prearranged results ; the Laws of Propagation of an Electrical Disturbance in a Submarine Cable ; the Effects of Self and Mutual Induction. There is also a lecture course on Optics and Sound, with special reference to their electrical applications.

Chemical Department.

The course of instruction in Chemistry is similarly arranged to those for other subjects. In the first and second years Chemical students take Engineering and Physics along with their Chemical work, and in the third year undertake Independent Chemical Investigations, and attend Lectures on Crystallography, on various branches of Physico-Chemical Inquiry and of Applied Chemistry. The aim is to prepare students for the higher posts in those industries in which Chemical knowledge is important.

THE TECHNICAL COLLEGE, FINSBURY.

During the time the Central Institution was building, the development of other parts of the general scheme was not suffered to remain in abeyance.

In order that a commencement might be made in the provision of Technical instruction for artizans and others, the Committee of the Institute, in the autumn of 1879, established some courses of Lectures and Laboratory instruction in Physics and in Chemistry in their application to different industries.

These classes were temporarily carried on in some school-rooms in the city. It was soon found that they supplied a distinct want, and that for their fuller development a specially-adapted building would be necessary ; and this was the origin of the Finsbury College, Leonard Street, City Road, E.C., which was opened in 1883.

The operations of this College are divided into two distinct portions—*Day Classes* for those who are able to devote one, two, or three years to systematic technical education, attended by about 185 students ; and *Evening Classes*, attended by about 1,100 students, for those who are engaged in industrial or commercial occupations in the daytime, and who desire to receive supplementary instruction in the application of science

and art to the trades and manufactures in which they are concerned.

The College embraces the following departments:—

Mechanical Engineering and Applied Mathematics.
 Electrical Engineering and Applied Physics.
 Industrial and Technical Chemistry.
 Applied Art (evening only).

The courses in these departments are full and complete, consisting of Lectures, Class Lessons, Laboratory Work, Drawing Office and Workshop Practice. There are five Electrical Laboratories; the mechanical laboratory, the drawing offices, and the pattern-shop and fitting-shop have lately been enlarged.

In the departments of Mechanical Engineering and Applied Mathematics, of Electrical Engineering and Applied Physics, the complete course of instruction extends over a period of two years; but students may remain longer. The complete course in the department of Applied Chemistry extends over three years.

The Evening Classes are largely attended by students from fourteen to forty years of age, the great majority of them being employed during the day in workshops or factories. There is an Evening Trades' Class Department, comprising classes in Plumbing, Sheet Metal Work, Builders' Quantities, Brick Cutting and Bricklaying, Carpentry and Joinery, Cabinet-making, and Practical Geometry.

THE ROYAL INDIAN ENGINEERING COLLEGE, COOPER'S HILL, STAINES.

This is one of the most important and complete of the modern establishments for Engineering Education, and it will be interesting to give, not only a description of its present arrangements, but also a brief notice of its origin and history, which throw light on the past state of Engineering Education in this country.

The institution was founded by the Secretary of State for India in 1871.

Some thirty years previously the Indian Government had awakened to the fact that there had been great neglect of Public Works in India, and that in this respect there was a

painful contrast between the results of our rule, and the vast remains still to be seen all over India and Ceylon, of great works and monumental constructions, due to the ancient native Monarchies of the country.

The obligations of the State in this respect began to obtain recognition about the year 1842, in which year the great Ganges Canal was projected, and the trunk road from Calcutta to the North West was set in progress. In 1849 the Punjab was annexed, which led to extensive works. A further impetus was given generally; and in 1854 the control of Public Works had attained so much importance that it was made a separate Department. From that time the outlay on public works continually increased, and in 1870 it had amounted to above seven millions annually; all this being exclusive of the railways, which were private undertakings. The Staff in 1870 comprised about 900 engineers, forming almost as large a body as the covenanted Civil Service.

Originally these engineers consisted wholly of military officers, but the wants soon outgrew this source, and about 1845 the civil element was first introduced. In 1847 the College at Roorkee was established, and began to send out a small number of young engineers, which was afterwards increased from other educational establishments in India, chiefly for training native subordinates.

These means of supply proving still inadequate, it became necessary to draw upon the Civil Engineering profession in England, and a beginning was made in 1854, when Lord Stanley sent out a few English engineers of experience, some of whom proved very valuable acquisitions to the service.

In 1859, after the mutiny, further requisitions were made, but the plan of sending out experienced men was found open to considerable objections. In the first place, such persons were under considerable disadvantages, being of mature age, unaccustomed to such a climate, and unacquainted with the language and usages of the country; and secondly, the introduction at intervals of new experienced engineers caused considerable difficulties in regard to the arrangement of the staff in the country. It was accordingly decided that the department should thenceforward be recruited at the bottom, by the annual appointment of a certain number of young men, who had received a reasonable preliminary education, and had gained some amount of practical experience.

It was supposed that among the large number of young men who were continually being trained for the profession of Engineering, many properly qualified persons might be found who

would be tempted to go out for the liberal life-provision offered by Indian Service, and it was determined to offer these appointments for public competition.

Accordingly examinations were instituted periodically, under the direction of the India Office, and subject to the following conditions:—

The candidates were to be not exceeding twenty-four years of age, and must have already passed three years either entirely with a practising engineer, or partly thus and partly in studying engineering in a school or college recognized for this purpose.

The subjects of examination included (1) Branches of preliminary education, such as Arithmetic, Mensuration, Trigonometry, Algebra, Euclid, and subjects in Mechanical Science; (2) Competence in Drawing and Surveying; (3) Questions in various branches of Practical Engineering, competency in any one sufficing for qualification.

These examinations were continued every year from 1859 to 1870, but the results were very unsatisfactory, so few of the candidates proving qualified. The examination was not strict, but superficial as it was, it was too severe for the candidates offering themselves; and although the standard was practically lowered from time to time, in the later years only about one-third of the appointments could be given away. General Chesney, in reporting to the India Office on this failure, made the following remarks, which (though the state of matters has now much changed) are historically interesting as exemplifying the state of Engineering Education at that time:—

The present mode of training an engineer, where a young man pays a fee to a civil or mechanical engineer for permission to work in an office or workshop, and pick up such crumbs of knowledge as fall in his way, is not education, and the cases must be very rare where persons, after undergoing such a training, will be found to pass an examination involving any knowledge of the principles of mathematics or theoretical mechanics. They usually take no knowledge of that subject into the office, and gain none there.

On this ground, therefore, the bulk of the candidates who had really practical qualifications, failed from ignorance of the principles of the work they were called on to do. When this was found out there arose a reaction, to push forward theoretical qualifications, and a supply of cramming schools, generally of very inferior character, sprang up to prepare young men for the examination. General Chesney said:—

The training of the bulk of the candidates who come forward usually consists in attending some school or college which professes to teach engineering, and then completing the requirements of the competition by spending a year with a civil engineer. It is for this last requirement

that the services of crammers have been found necessary, for the leading civil engineers will not take pupils for a single year. Besides, civil engineers in practice do not profess to teach pupils systematically; they leave them to train themselves, and the young men coming up to these examinations are thus driven to a class of persons who lay themselves out specially for this task, who have no professional practice, and whose qualifications are limited to being able to teach a little drawing and surveying. But since it is open to any person to style himself a Civil Engineer, and to take pupils, the year passed in this way qualifies for the competition.

In this difficulty it became the duty of the Indian Government, in the interests of the public service, to take special means to obtain, for those who entered the Indian Engineering Service, that scientific education which it appeared so difficult to obtain among the ordinary junior ranks of the profession.

With this view they determined to found an Engineering College near London, where a number of young men, admitted by open competition as the most promising on intellectual grounds, should be given, under competent professors, the most complete technical education that a college course could afford.

After this they were to be sent for a time to gain practical experience under a professional engineer, and then were to go out as assistants on the works in India, where, as their qualifications became more matured, they were to be gradually promoted to more responsible service.

The College was opened in 1871. There was no lack of promising candidates for admission; the proposed plan of training was fully carried out, and the result was that about forty well-qualified recruits were sent out from the College annually to take service on the Public Service in India, where their work fully justified the system under which they were educated and chosen.

This had gone on for seven years, when, in 1878, the Indian Government, from imperative financial reasons, found it necessary to curtail largely the expenditure on public works, and, as a consequence, to diminish the annual supply of Assistant Engineers by about one-half.

The continued maintenance of the College under these new circumstances became a financial question, which remained unsettled for two or three years. The Government and the authorities of the College took the wise step of asking the advice and assistance of some professional Civil Engineers, among whom were Sir John Fowler and the late Sir William Siemens, who had both taken special interest in Engineering education.

These gentlemen advised that, in addition to the students

who might be selected for the Indian Service, the facilities of the College should be thrown open to the public, and that such changes should be made in its constitution and curriculum as would make it attractive to students who, while able to afford the expensive education, were willing to look for a professional career elsewhere than in the service of the Indian Government.¹ A confident opinion was expressed that if this course were adopted, the vacancies left in the College by the altered policy would be filled by students of the class mentioned.

These changes, after being well considered, were carried out in 1883. The expectations regarding them have been fully justified, and now, at the beginning of every annual session, the College receives candidates for its appointments and diplomas up to the limits of its accommodation.

The curriculum at this College is very complete.

Admission to it is entirely open to all comers who conform to the regulations, about fifty students being admitted annually in September.

Candidates must be between the ages of 17 and 21; they must produce evidence that they are of good moral character, and they must have received a good general education; in addition to which they must have such a proficiency in elementary mathematics as will enable them to follow the College course with advantage.

The admission examination to test this is not competitive and includes :—

(a) English composition, to the extent of being able to write grammatically, and with correct spelling, in a neat and legible hand. The general education is tested by an examination in some classical or modern language, as well as in history or geography.

(b) Elementary Mathematics, comprising :—

Arithmetic.

Elementary Algebra.

Geometry (the first four and sixth books of Euclid).

Elementary Mensuration.

” Plane Trigonometry.

The use of Logarithms.

In the event of there being more qualified candidates for admission than the College can receive, the preference is given according to dates of application.

The whole or any portion of the entrance examination may be dispensed with if the candidate produces a University diploma or other equivalent certificate of a recognized examining body.

¹ See “The Life of Sir William Siemens,” by W. Pole. London. 1888.

The course of education occupies three years, and is of a mixed character, comprising partly advancement in general scientific attainments, partly instruction in regard to the nature of engineering practice, drawing and surveying being thoroughly taught, and, especially under the head of "Applied Mechanics," the established theories of various branches of engineering.

The following description will illustrate this:—

First Year.

Descriptive Engineering.
 Geometrical and Engineering Drawing.
 Surveying (partly in the field).
 Freehand Drawing.
 Chemistry, and Chemical Laboratory.
 Physics.
 Mathematics (plane analytical geometry, elements of the calculus, statics, kinematics, and the elements of kinetics).
 Geology
 Elements of Architecture.
 • French or German.
 Workshop.

Second Year.

Engineering and Applied Mechanics.
 Geometrical and Engineering Drawing.
 Surveying.
 Chemistry.
 Physics and Physical Laboratory.
 Mathematics.
 Geology.
 Elements of Architecture.
 French, or German, or Freehand Drawing (Alternative).

Third Year.

Engineering and Applied Mechanics.
 Accounts.
 Estimating.
 Mechanical Laboratory (testing, &c.).
 Photography.

During this year also, in addition to the class instruction, the students are employed in making a complete detailed survey in the field, with plans, estimate of quantities, &c., for a project for two or three miles of railway, road, or canal. They have also to work out three complete and detailed designs, the subjects being chosen from building construction and both civil and mechanical engineering.

Some of the subjects named are wholly or partially optional or alternative, the students being encouraged to pursue more particularly those branches of study for which they may show special aptitude.

There are also special courses for Telegraph Engineering and for Forestry to train selected candidates for those departments of the Indian Administration.

The proficiency of the students is tested by frequent periodical examinations, and by assigning values to the practical work executed during the course.

Superior attainments are attested by special diplomas.

A final examination is held at the end of each separate course, with the assistance of special examiners not connected with the College.

The Secretary of State for India offers annually a number of appointments, in the Indian Public Works Department, for competition among the students of the College, who are eligible in the order of standing after the final examination. Those so appointed have, after leaving the College, to go through a course of practical engineering (usually for one year) under a professional engineer. The cost of this is paid by the Government, and the student receives pay during the time.

In the case of students who are not so appointed, the College authorities endeavour, on the students' application, to arrange for placing them as pupils with professional Engineers of standing, at moderate rates of premium, payable by the students.

The staff of the College comprises 18 professors, lecturers, and demonstrators, not including those engaged exclusively in the department of Forestry.

THE ROYAL NAVAL COLLEGE, GREENWICH.

This Institution is intended chiefly for the high class instruction of Officers of the Navy; but private students are also admitted.

It has a very extensive general curriculum, which it is unnecessary to particularize here. The branches bearing on engineering subjects are—

- Mechanical and Physical Science.
 - Naval Architecture.
 - Marine Engineering.
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CRYSTAL PALACE SCHOOL OF PRACTICAL ENGINEERING.

This School, established in 1872, has for its purpose to give thoroughly practical instruction, duly worked out as to details, which may serve as the proper basis for a calculated course of after practice, and be in fact a first step in the professional career. "The leading object," it is said in the prospectus, "is to prepare students, by systematic practical instruction, for professional articles; so that on entering an Engineer's office or works, the pupil may at once be useful to his principal, and enabled to take advantage of the opportunities for learning open to him, because he has mastered the elementary details of the profession."

The curriculum has in other ways a more extended application, theoretical as well as practical.

The first year is devoted to Mechanical Engineering, and comprises instruction in—

Mechanical drawing—making drawings of machinery and constructions, including setting out quantities and estimates, and calculating the strength of materials.

Pattern-making—preparing patterns or models of engines and machinery.

Foundry work—moulding, and making castings.

Smith's work—working iron and making forgings.

Fitting shop work, the use of tools, and fitting and erecting engines and machinery.

The second year's course is devoted to Civil Engineering, comprising—

General surveying and levelling, including whatever is necessary for public works, such as railways, or docks, and the preparation of plans and estimates for Parliament, &c.; going on to specifications and working plans; calculations, &c., in detail of iron bridges and other structures; the investigation of great engineering works in progress, and the general application of principles to practice.

Further instruction is also given in regard to electric work, and to marine engineering.

There is also a "Colonial Section" of practical education and information, designed especially for persons going to the colonies or abroad, as explorers or settlers.

Examinations are held at the end of each term, by engineers not connected with the school.

PROVINCIAL, ENGLAND.

UNIVERSITY OF OXFORD.

The Millard Laboratory was opened by Trinity College in 1886, and in 1888 was enlarged by the addition of adjoining rooms lent by St. John's College. For the last two years it has been supported by the University from the Common University Fund.

The object of the course of instruction is to place before students those fundamental principles on which Mechanical and Electrical Engineering, as well as certain branches of Physics, are based, and without which the manual training of a workshop appears to be incomplete. The principal training is in the experimental methods by which the constants most frequently employed in Mechanical and Electrical Engineering are determined; modern graphic methods are largely used. Mechanical work and fitting is taught only so far as is necessary to show how machine and other tools are used, and processes of construction conducted, and the practical work in this branch of engineering is confined to the production of surface plates (by Sir J. Whitworth's method), and those parts of machines which present no very great difficulty in construction, though they require close and accurate work.

The view taken by Professor Kennedy, F.R.S., in a paper on "The Use and Equipment of Engineering Laboratories,"¹ describes the lines on which, as far as possible, the instruction in the Millard Laboratory has been conducted. The training recommended by the Professor appears to provide exactly what is wanted in order to supply that part of a student's education which in all probability he will not be likely to get either before or after going into "works" or entering upon the business of life. It may be as well to mention some of the different classes of students in the Universities to whom a training, such as has been mentioned, may be of value. They are as follows:—

Men who are going to be Engineers or Architects, and wish to receive some training in the first principles of their subject.

Men who do not take up the work with a view to a profession, but wish to use close and accurate observation of natural phenomena as a mental cultivator.

Medical students, who are required to pass a preliminary examination in Mechanics and Physics.

¹ Minutes of Proceedings, vol. lxxxviii, p. 1, reprinted in Appendix B.

Law students, who wish to acquire a knowledge of technical terms and scientific principles, such as are involved in patent and other cases.

A considerable number of men from each of these branches of study have now gone through courses of instruction in the Laboratory.

The Laboratory consists of:—

(a) A Lecture Room furnished with apparatus for illustrating the principles of Mechanics and Hydrostatics, and provided with a supply of electricity from both dynamos and accumulators, and an electric projection lantern.

(b) An Experimental Room, in which experiments involving the use of complicated apparatus can be done. This room contains a standard clock with electrical attachments, a chronograph, testing machines, and various forms of measuring instruments. Instruments for determining the velocity of flow of liquids.

(c) An Engine Room, which contains a steam-engine and boiler, gas-engine, three dynamos, transmission and turbine dynamometers. The steam-engine and boiler are fitted with the apparatus necessary for testing their efficiency.

(d) A Machine Room, containing two Whitworth lathes, one lathe with micrometer dividing head by Cook and Sons, York, and other light lathes, together with drilling, planing, and milling machines, and a full supply of engineers' hand tools.

(e) An Instrument Room, devoted to electrical testing, and containing galvanometers, electrometers and other electric measuring instruments, and various forms of incandescent and arc lamps, and photometric apparatus.

(f) A Book Room, containing books of reference, apparatus used for drawing and machine construction, planimeters and integrating instruments.

Lectures on Applied Mathematics and Graphic Methods, and certain branches of Physics which bear on engineering work, are given throughout the University terms.

UNIVERSITY OF CAMBRIDGE.

The University of Cambridge includes a Department of Engineering which is under the charge of the Professor of Applied Mechanics and Mechanism. The Professor is assisted by two demonstrators.

The work of the department comprises (1) Lectures, (2) Drawing-office instruction, (3) Laboratory instruction and research (4) Instruction in workshop practice, (5) Practical instruction in field-work.

(1) *The Lectures* cover the portions of the Theory of Engineering usually studied in a university course, namely: Applied Mechanics; the Strength of Materials; the theory of the Strength and Stiffness of Structures; Graphic Statics; the theory of Heat-engines and the working of Steam-engines and Gas-engines; the Production and Distribution of Power; the Kinematics and Dynamics of Machines; Hydraulics; Electro-technics, including the design of Dynamo-electric machines, Electric Lighting, and the Electric Transmission of Power.

(2) *Drawing Office*.—Lectures are given on Plane and Descriptive Geometry and on Machine Design, and on the application of graphic methods in the solution of engineering problems. The pupils are practised in sketching machines from measurement and in making working drawings, and gain some experience in the ordinary work of an Engineer's office.

(3) *Laboratory*.—The pupils make an experimental study of problems in statics and kinetics, also of the strength and elasticity of iron, steel, timber, and other materials of construction; the deflection of beams; the strength of columns; the torsion of shafts; the friction of sliding pieces, of journals, and of belts or pulleys; the efficiency of transmitting mechanism; the discharge of water through orifices and over notches; the accuracy of pressure gauges, indicator springs, &c.; the working and efficiency of the steam-engine and gas-engine.

There is an experimental steam-engine adapted to be run under various conditions, as to expansion, condensation, jacketing, superheating, &c., and very fully provided with means of measuring the heat supplied, the heat rejected, the work done, the dryness of the steam throughout its passage through the engine, the mechanical efficiency, and other points of practical and theoretical interest.

The laboratory is further provided with appliances for experimental work in practical electricity—dynamo, storage battery, and a variety of instruments for measurement, including a series of Sir William Thomson's new current balance.

(4) *The Workshops* are furnished with lathes, planing, shaping, and slotting machines, forge, and other appliances necessary to give pupils a general acquaintance with the processes of metal working and wood working. A staff of skilled workmen is employed to give instruction in each branch.

Although the workshops have been arranged on a considerable

scale the use of them is by no means intended to take the place of pupilage in a larger establishment. It will, however, be found to form a valuable preparation for that, enabling the pupil to learn the lessons which the larger establishment has to teach him in a much shorter time than he would otherwise take. The workshops also form an almost indispensable adjunct to the laboratory; further, they are taken advantage of by many members of the University who do not intend to become Engineers.

(5) *Instruction in Field-work* is given by lectures and by practice in the field. The pupils are taught to adjust the instruments, to perform the usual operations with chain, compass, sextant and theodolite, to set out curves, to keep the field book, and to draw plans of the surveys they have made.

The department includes a museum which contains, with other things, the collection of kinematic models prepared by the late Professor Willis. The buildings of the department adjoin the Cavendish (physical) and the Chemical Laboratories of the University. The department is open to Members of any of the Colleges, and to Non-Collegiate Students of the University.

OWENS COLLEGE, MANCHESTER.

This College was founded in 1851, under the will of Mr. John Owens, merchant, of Manchester, and was reconstituted and incorporated by Act of Parliament in 1871.

There are four departments, the first of which, allotted to "Arts, Science, and Law," comprehends (in addition to Professorships in classics, history, &c.) Professorships or Lectureships in Pure Mathematics; Applied Mathematics, Physics, Chemistry (Organic and Technological), Metallurgy, Mineralogy, and Geology.

There is also in the same faculty a "Beyer Professorship of Civil and Mechanical Engineering, and Geometrical and Mechanical Drawing," which was founded in 1868.

The first year's course in this comprises—

Measuring Instruments.
 Plain Geodesy or Surveying.
 Levelling.
 Underground Surveying.
 Setting out.
 Hydrography.
 Quantities and Estimating.

Hydraulic Surveying.
 Earth-work.
 Masonry.
 Timber-work.
 Foundations, &c.

The second year's course contains—

Theory of Concrete Forces.
 Theory of Simple Structures.
 Strength of Materials.
 Mechanical Connexion, or Kinematics of Machinery.

The third year's course is devoted to—

Dynamics of Machinery.
 The Theory and Construction of Machines.
 Hydraulics and Hydraulic Machinery.
 Steam and the Steam-Engine.

Visits are made, when circumstances permit, to inspect some of the most important engineering and manufacturing works in Manchester and the neighbourhood.

There is also an *Engineering Laboratory* attached to this College. By this is to be understood something essentially distinct from a workshop, the objects sought being to enable students to practise those methods of measurement of quantities, whatever their nature, which belong to the work of the Engineer.

It is pointed out that the making of tests, in particular, for materials and machines, and the reduction of their results, have become a most important part of the Engineer's work. The training for this is especially scientific, and can best be acquired in a laboratory worked in connexion with a course of scientific study. On the other hand, the laboratory work, by familiarising the student with practical mechanics in their higher developments, and by furnishing actual examples, will give to his scientific training a reality, the want of which has hitherto been greatly felt.

A course of instruction in laboratory work and drawing is arranged in connexion with the Engineering Lectures.

There is a class for *Practical Surveying*, to be carried on in convenient localities not too far from the College.

A *Geometrical and Mechanical* drawing course, of combined lectures and practical studies, is also arranged.

This College is affiliated to the "Victoria University, Manchester," which was founded by Royal Charter in 1880. Among the degrees granted there is that of "Bachelor of Science," which may be taken in five branches: Mathematics, Engineering, Experimental Science, Biology, and Geology.

Certificates in Engineering are awarded somewhat similar to that for the B.Sc. degree of the Victoria University.

MANCHESTER TECHNICAL SCHOOL.

In this Institution there are *Departments of Science and Technology*, which include classes for day and evening students in the Theory and Practice of Electrical and Mechanical Engineering and in Building Construction.

UNIVERSITY COLLEGE, LIVERPOOL.

The work of this College commenced in 1882, its object being in the words of the charter—

To provide such instruction in all the branches of a liberal education as may enable residents in the City of Liverpool and the neighbourhood thereof to qualify for Degrees in Arts, Science, and other subjects at any of the Universities granting degrees to non-resident Students, and at the same time to give such technical instruction as may be of immediate service in professional and commercial life.

In 1884 the College became incorporated in the Victoria University (the Owens College, Manchester, being then the other incorporated College, the Yorkshire College, Leeds, having since become incorporated). The College can thus prepare students for its own University degrees in Arts, Science, Law, and Medicine, both ordinary and honours degrees in Engineering being included in the Science faculty.

The Department of Engineering was organized in October, 1885, and since October, 1889, its work has been carried on in the block of buildings known as the Walker Engineering Laboratories (after Sir Andrew B. Walker, Bart., by whom they were built and equipped).

The training given is regarded as either preliminary to, or supplementary of, a pupilage under some Engineer, or apprenticeship with some Engineering firm.

• Courses of instruction are arranged as follows:—

First Year.—Engineering, Drawing, and Design, Descriptive Geometry, Surveying, Workshpp Instruction, Mathematics, Mechanics, and Physics.

Second Year.—Engineering, Drawing and Design, Descriptive Geometry, Laboratory Work, Surveying, Mathematics, Chemistry, and Physics.

Third Year.—Engineering Design, Laboratory Work, Mathematics, Physics.

The above courses are arranged so as to make it possible for students to take the work of the 1st and 2nd terms only, and enter some Engineering works during the summer (viz. from April to October).

The actual subjects taught under the head of Engineering are as follows :—

First Year.

- 1st Term.* Measurements and Units.
Laws of Force and Motion, and the Dynamics of Machines.
The principle of Work and its applications.
The Nature and Laws of Friction.
Modulus of Machines.
Graphic Statics.
- 2nd Term.* Hydro-Mechanics.
Stability of Walls, &c.
Motions of Fluids.
Flow in Pipes and Channels.
Resistance of Ships.
Pumps.
Pneumatics.
- 3rd Term.* Brickwork, Stones, Cements, Masonry.
Foundations, Piles, Cofferdams.
Common Roads.
Railways and their appurtenances.
Bridge Construction.
Canals, Streams, and Rivers.
Marine Engineering—Piers, Harbours, Docks.
Waterworks.
Drainage and Irrigation.

Second Year.

- 1st Term.* Machines and Mechanism of various kinds.
2nd Term. Prime Movers of various kinds.
3rd Term. Advanced Bridge Construction.

Third Year.

- 1st Term.* Theory of Simple and Complex Structures.
2nd Term. Kinematics and Dynamics of Machines.
3rd Term. Advanced Theory of the Steam-Engine and other prime movers, Thermo-Dynamics.

Under the head of Engineering Drawing and Design is included in the first year—

A general description of materials used in machine construction, their strength, properties, and behaviour under the action of loads. The testing of materials. Simple problems in connection with forces acting in parts of structures and machines. The strength and form of riveted joints. The dimensions and strength of bolts, nuts, keys, and cotters. The strength and construction of pipes and cylinders.

And in the second year—

The effect of live loads. The theory and practical calculations required in dealing with the transmission of power by various means, such as by shafting, toothed friction, and screw gearing. The strength and form of

the essential parts of machinery. The form and dimensions of valves, and design of valve gears. The design of complete machines and the preparation of working drawings.

A College certificate in Engineering is awarded independently of the Victoria University degrees, and for this certificate the foregoing courses prepare students.

There is a summer vacation course in workshop practice and laboratory work.

Different courses of evening lectures in Engineering subjects suitable respectively for artisans and for professional men are given annually.

A special Engineering Prospectus is issued by the College.

YORKSHIRE COLLEGE, LEEDS.

This College was established in 1873, with the following objects—

To found, endow, and maintain, in the County of York, a College or Colleges, and by means thereof and by means of lectures to be delivered in any towns or places in that county, or by such other means as the Association may think proper, to promote the education of persons of both sexes, and in particular to provide instruction in such sciences and arts as are applicable or ancillary to the manufacturing, mining, engineering, and agricultural industries of the county of York, and in ancient and modern languages, history and literature, medicine, surgery, law, logic, moral philosophy, and any other subjects of University or College teaching, and in such other branches of education as shall from time to time be directed by the governing body.

The distinguishing feature of this College is the dual character of its work; equal importance being attached to the training of young men who are intended for professions and trades, and to the preparation of others for University degrees in the various faculties of science, arts, and medicine. In the former department there are classes and elaborately-equipped workshops and laboratories, dealing specially with the following subjects—

- Engineering (Civil, Mechanical, Electrical and Mining).
- Physics.
- Coal Mining and Colliery Management.
- Textile Industries.
- Dyeing and Printing Textile Fabrics.
- Leather Industries.
- Agriculture.
- Freehand and Geometrical Drawing.
- Book-keeping, Shorthand and Commercial Business.
- Practical Chemistry, &c.

In the *Department of Engineering*, the instruction extends over three sessions, and comprises Lectures on engineering principles and practice, geometrical and technical drawing, demonstrations and practice in the engineering laboratory, and visits to engineering works, and to manufactories.

There is also an *Elementary Engineering Class*, conveying instruction on simple principles, and as far as possible suitable for students who enter with little or no previous mathematical knowledge.

The Yorkshire College, with Owens College, Manchester, and University College, Liverpool, constitute the Victoria University.

BRADFORD TECHNICAL COLLEGE.

There is an *Engineering department* at this institution, and regular courses are given in Civil, Mechanical, and Electrical Engineering, which are stated to afford a sound theoretical and practical education to students.

It is intended that whilst preparatory to entering an Engineer's office or works, the general training shall be of such a nature as to be directly and immediately useful in business after the college courses are completed.

THE DURHAM COLLEGE OF SCIENCE, NEWCASTLE-UPON-TYNE.

This College is intended to "Represent the Faculties of Science and Engineering in the University of Durham, and thus to constitute an important portion of the University of the North of England."

It aims at supplying the higher educational needs of the whole of the district of which Newcastle is the commercial capital.

Complete courses of instruction have been organised in Mechanical and Marine Engineering, Naval Architecture, Mining Engineering, Electrical Engineering, and applied Chemistry.

The college possesses complete chemical and physical laboratories with special facilities for the study of technical electricity; a new metallurgical laboratory will be opened in October, 1891, and arrangements are being made for the immediate erection of the George Stephenson Engineering Laboratory.

THE MASON SCIENCE COLLEGE, BIRMINGHAM.

This Institution, founded by Sir Josiah Mason on the 23rd February 1875, was opened in 1880.

There are two Faculties, viz., of *Arts* and *Science* respectively.

The latter contains all the usual subjects, and comprises also a *Department of Civil, Mechanical, and Electrical Engineering*.

Like most other courses of this nature, it extends over three years, and its nature may be gathered from the following extracts from the calendar.

It will be seen that the plan of instruction is: Firstly, to describe the *facts* of engineering, i.e., the tools, machinery, and methods used by engineers; secondly, to develop theoretical engineering science as based on these facts; and thirdly, to apply the scientific knowledge of facts and theory to practical problems in engineering design.

The whole of the teaching in the classes is practical and technical in its aim, no theory being introduced except such as has a direct bearing on the problems of professional practice, and no theories being taught until the facts upon which they are based have been fully explained.

The practical work in the drawing, exercise, and laboratory classes is designed to give familiarity with the processes, calculations, and materials used in engineering establishments and in surveying. In this laboratory the student makes experimental investigations of the properties of tools, machines, and materials, such as he can have no opportunity of making during an apprenticeship at work.

College study cannot, however, supersede the desirability of a formal or informal apprenticeship; but this apprenticeship may be shortened by two or three years if the student follows the engineering course offered in Mason College.

Certificates and Diplomas are given during the course and at its close.

Besides the ordinary entrance, and First and Second Year's Scholarships, the values of which range from £20 to £30, a "Tangye" Technical Scholarship in Engineering, of the value of £30, is annually awarded. There is also a £150 scholarship offered yearly to students in Technical Science by the Commissioners of the Exhibition of 1851.

UNIVERSITY COLLEGE, BRISTOL.

This College was established in 1876. It has classes of the ordinary kind, and includes a *Department of Engineering and the Constructive Professions*.

It is stated in the Calendar, that—

The instruction in this department is designed to afford a thorough scientific education to students intending to become Engineers, or to enter any of the allied professions, and to supplement the ordinary professional training by systematic technical teaching.

The "Course for Students intending to become Civil Engineers or Surveyors," has been arranged to extend over two years; but special arrangements will be made for students who may deem it advisable to remain for a third year.

There is also a "Course of Mechanical Engineering," a "Course of Electrical Engineering," and a "short Course of General Engineering," the latter being intended to meet the requirements of draughtsmen and others who cannot spare time to follow out any of the complete courses.

The subjects included are of the usual character.

There is a Mechanical Laboratory in which material is tested for commercial purposes.

UNIVERSITY COLLEGE, NOTTINGHAM.

This Institution was established in 1881. In addition to the subjects of ordinary education it contains many commercial and technical classes.

Complete courses of instruction, extending over three years, are arranged for boys who have just left school, and intend to become Civil, Mechanical, Electrical, and Mining Engineers. The object of each complete course of study in the workshop, lecture room, laboratory, and drawing office, is to give the students such a scientific and technical training, directly bearing upon industrial work, as will fit them to enter the factory or workshop with a thorough grip of the principles underlying their work. Advanced students will be permitted to join the middle or senior courses, if in the judgment of the Professor they are properly qualified. The workshops at present comprise two pattern maker's and carpenter's shops, a foundry, a smithy, a fitting, turning, and erecting shop, and a dynamo shed, containing a three-light Brush machine, a Ferranti dynamo, and Siemens exciter. Students receive instruction in Mathematics, Mechanics, Engineering, Mechanical Drawing, Physics, Chemistry, and Metallurgy, including laboratory work, and are trained in the use of tools under skilled instructors in the workshops. Advanced students have also experience during the summer term in the works of several engineering firms in town, including the Waterworks of the Corporation of Nottingham. There will also be demonstrations in surveying, levelling, testing the strength of material, engine trials, and general installation work.

The course of instruction is the same for all students during the first year. The subjects of the second year's course are

also the same for those intending to become Mechanical and Electrical Engineers. In the third year they specialise according to the particular branch of Engineering they intend to follow. Electrical Engineering students take charge of the electric lighting of the College for a week at a time in turn throughout the winter and spring. These students are allowed to look after the dynamo and the arc lamps, and make the necessary measurements of power and light. Special facilities are afforded for testing the experimental dynamo driven by the Atkinson cycle gas engine. Instruction is given in the management and methods of testing dynamo-electric machines and electro-motors, accumulators, arc and incandescent lamps.

Arrangements will be made for students to visit and inspect works in progress as well as factories and workshops, and when possible they will be encouraged and aided in making original investigation.

FIRTH COLLEGE, SHEFFIELD.

This Institution was founded in 1879 by Mr. Mark Firth, an eminent steel manufacturer. Originally intended as a Hall and Lecture-room, in which the Cambridge Extension Lectures could be given, its scope soon became enlarged so as to fill the position of a local University College for Sheffield.

The aim of the Firth College is to provide for the people of Sheffield and the district the means of higher literary and scientific education by University methods of teaching. Its doors are open to all, without distinction of sex or class, who are over seventeen years of age, though the limit of age may be lowered in exceptional cases. It forms one of the series of local University Colleges which have been founded, chiefly within the last decade, to spread the advantages of University education throughout the kingdom, and to attract and develop all the best intellects, wherever they may happen to appear. Amongst their chief functions may be mentioned:—

(1) The provision of higher education, by University methods, for students above ordinary school age in the large towns, such provision including laboratories and appliances for practical work in the experimental sciences.

(2) The means of teaching the applications of pure science to the technical operations carried on in their districts.

(3) Placing the means of higher education within reach of all, whose business or work would otherwise prevent it, through evening classes and laboratory work.

To which may be added (4), the means of original research in science or its applications.

SHEFFIELD TECHNICAL SCHOOL.

This was established in 1880 as a branch of Firth College, Sheffield, but is now separate, and is managed by a committee of the Corporation, with representatives of Firth College. It is maintained under the Local Taxation Act of 1890. The work of the institution is divided into three departments:—I. The Junior Day Department; II. The Senior Day Department, including (i.) the engineering section, and (ii.) the metallurgical section; III. The Evening Department, comprising, amongst others, special sections of engineering, metallurgy, mining, and building.

The complete course in Mechanical Engineering extends over three years, and includes, in addition to the lectures, work in the laboratories and in the workshops and drawing offices. The laboratory appliances include a 50-HP. steam-engine, a 4-HP. gas-engine, a 50-ton Buckton testing machine, and a hydraulic force pump and accumulator. There are also a machine and fitting shop, a wood-work shop, a smith's shop, and a foundry. The drawing office accommodates eighty students working at one time.

The lectures on Mathematics, Mechanics, Physics, and Chemistry to senior day students are given at Firth College by the respective professors. A student passing in the first class in the annual examination at the end of his course is awarded a diploma as an Associate of the Technical School.

Associated courses in Engineering, Metallurgy, Electrical Engineering, and Coal Mining, are given by Firth College to those students who have gone through a specified three years' course, and have passed the required examination.

THE HARTLEY INSTITUTION, SOUTHAMPTON.

This Institution was founded, in 1862, by the bequest of Mr. H. R. Hartley, "To promote the study and advancement of the Sciences of Natural History, Astronomy, Antiquities, Classical and Oriental Literature, and the Fine Arts, in the Town of Southampton."

An Engineering Department forms part of the educational

scheme. In this department students intended for the engineering professions receive a course of instruction in Pure and Applied Mathematics, Geometrical, and Engineering Drawing, and Mechanical, Physical, and Chemical Sciences. Physical and chemical laboratories are provided, and a mechanical laboratory will shortly be built. Practical surveying and levelling are taught in the field.

WALES.

UNIVERSITY COLLEGE OF SOUTH WALES AND MONMOUTHSHIRE.

The ninth session of this College begins on October 5th, 1891, and ends on Friday, July 24th, 1892.

The Department of Engineering already comprises the scientific sides of the most important branches of engineering, and it is hoped that the authorities of the College may be in a position at no distant date to appoint a separate lecturer or professor of mining and metallurgy.

The ordinary engineering course extends over three years, the first two of which are to be devoted to the study of Drawing of all kinds, and the principles of Applied Mechanics and Mechanical Design. In their third or last year students will be encouraged to specialize in particular branches.

The plans for the new engineering buildings which have recently been adopted are of the most complete character. Amongst other accommodation for the department they include a lecture room, drawing office, laboratory, machine shop, engine and dynamo room, and boiler house. The equipment of the laboratory and machine shop will be of the highest degree of excellence.

SCOTLAND.

UNIVERSITY OF GLASGOW.

This is one of the oldest Universities in Great Britain, having been founded by Pope Nicholas V. in 1450.

In addition to the usual instruction in Mathematics, Natural Philosophy, Chemistry, &c., a special Chair of *Civil Engineering and Mechanics* was founded by Queen Victoria in 1840.

The classes are arranged as follows :—

COURSE I.—*The Materials of Construction and the Elements of Applied Mechanics.*—The lectures will treat of the origin, preparation, properties and uses of the chief constructive materials, especially of cast-iron, wrought-iron, and steel, brass and other alloys, timber, building stones, cements and concrete, and of the more elementary principles of mechanics in their application to problems connected with engineering structures and machines.

COURSE II.—*Surveying, Levelling, and Setting-out of Works.*—Surveying with the chain and with angular instruments; levelling; the optical and mechanical principles, tests, and adjustments of surveying and levelling instruments; setting-out of works, especially setting-out of railways; mensuration of areas of land and of volumes in earthworks, etc. The lectures will treat for the most part of those portions of the subject which are not readily learned in ordinary field and office practice.

COURSE III.—*Prime Movers and the Mechanics of Machinery.*—The lectures will treat of the theory of steam and gas engines, the structural details of boilers and engines, the mechanics of machinery, the elements of machine design, the transmission of power, and friction and lubrication in machines.

COURSE IV.—*Higher Applied Mechanics and Hydraulics.*—The lectures will treat of the strength and elasticity of materials, the strength and stiffness of beams, girders, columns, framed structures, &c. Hydraulics and hydraulic appliances, including the gauging of water, the flow of water in pipes, and the principles of water wheels, turbines, and centrifugal pumps.

Engineering Drawing and Calculations.—The work of the classes will comprise lectures and practice in civil and mechanical engineering drawing, descriptive geometry, and graphical statics, and special times will be set apart for the performance of graphical work and calculations in connection with the lecture courses.

Attached to the syllabus are the following remarks :—

The courses of the professor of engineering extend throughout the winter session, that is, from the beginning of November till the end of April. They comprise lectures on Engineering Principles and Practice, instruction in Geometrical Drawing and in Engineering Drawing and Calculations, and visits to Engineering Works and Manufactories.

These courses are designed primarily to suit students who intend to devote themselves to Civil, Mechanical, Electrical or Mining Engineering, but the work of the classes will be found of direct practical utility to Architects and to men who are engaged in any occupations connected with manufactures.

The work of the classes is not intended in any way to supersede the usual requirements of pupilage or apprenticeship in engineering, but to enable the Engineer to gain such a knowledge of the principles underlying his profession or trade as he cannot acquire by only working in the office, in the field, or in the workshop. The classes may be attended either before or after pupilage or apprenticeship, or concurrently therewith.

There is also a Professorship of Naval Architecture, including

Marine Engineering, which was founded by the widow of Mr. John Elder in 1883.

The curriculum comprises Junior and Senior Courses of Lectures on Naval Architecture and Marine Engineering and Junior and Senior Courses of Instruction in Ship-drawing and Calculations.

This University grants, after due examination, the degree of B.Sc. in Engineering Science, and the degree of D.Sc. is granted on terms set forth in the University Calendar; Certificates of Proficiency in Engineering Science are also given.

CURRICULA FOR THE B.Sc. DEGREE.

There are four alternative courses for the degree of B.Sc. in Engineering:—(a) Civil Engineering; (b) Chemical and Mining Engineering; (c) Mechanical and Electrical Engineering; (d) Naval Architecture and Marine Engineering.

The courses of study are as follows:—

(a) *Civil Engineering.*

1. Mathematics.
2. Natural Philosophy.
3. Chemistry.
4. Geology.
5. Geodesy.
6. Practical Chemistry, or Physical Laboratory, with a practical examination in the work of whichever is chosen.
7. Engineering Classes I., II., IV.
8. Engineering Drawing and Calculations.

(b) *Chemical and Mining Engineering.*

1. Mathematics.
2. Natural Philosophy.
3. Chemistry.
4. Geology and Mineralogy.
5. Chemical Laboratory.
6. Engineering Classes I., II., III., and IV.
7. Engineering Drawing and Calculations.

(c) *Mechanical and Electrical Engineering.*

1. Mathematics.
2. Natural Philosophy.
3. Chemistry.
4. Geology, or Geodesy, or Practical Chemistry.
5. Physical Laboratory.
6. Engineering Classes I., III., and IV.
7. Naval Architecture, Junior.
8. Engineering Drawing and Calculations.

(d) *Naval Architecture and Marine Engineering.*

1. Mathematics.
2. Natural Philosophy.
3. Chemistry.

4. Chemical or Physical Laboratory, with a practical examination in the work of whichever is chosen.
5. Engineering Class III. or IV.
6. Naval Architecture, including Marine Engineering.
7. Ship Drawing and Calculations.

The following notes were published by Professor D. J. Macquorn Rankine, in 1865.

1. Preliminary Education.

Of the ordinary branches of elementary education *arithmetic* is of special importance to the student of Engineering; and he ought to be familiar in particular with the most rapid ways of performing calculations consistently with accuracy.

It is desirable that he should be well instructed in engineering and mechanical drawing as part of his preliminary education; but he may, if necessary, obtain that instruction during the intervals of an University course.*

It is also desirable, *if possible*, that the elementary parts of mathematics, such as plane geometry, plane trigonometry, and algebra as far as quadratic equations, should form part of his preliminary education, as thereby time and labour will be saved during his University course.

2. University Course.

The course of study and examination adopted by the University of Glasgow is described in the Glasgow University Calendar.

In drawing up that course the University have had in view to avoid altogether any competition with the offices of civil engineers, or the workshops of mechanical engineers, or any interference with the usual practice of pupilage or apprenticeship; and they have accordingly adopted a system which is capable of working in harmony with that of pupilage or apprenticeship, by supplying the student with that scientific knowledge which he cannot well acquire in an office or workshop, and avoiding any pretension to give him that skill in the conduct of actual business which is to be gained by practice alone.

The University course may be gone through either before, during, or after the term of pupilage or apprenticeship, according to convenience. An arrangement which is sometimes found to answer well is to devote the winter to academic study, and the summer to the practice of engineering. A student who is not a candidate for a certificate in engineering science may attend as few or as many classes as he thinks fit.

UNIVERSITY OF EDINBURGH.

In this University, founded in 1583, there are four Faculties: Arts, Divinity, Law, and Medicine. The usual science subjects are at present comprised within the Faculty of Arts, in which there is also a Department of Engineering established in 1868.

* As stated above, instruction in drawing now forms part of the University curriculum.

I. *Class of Systematic Engineering.*—The object of this course is to show the practical application of science to various branches of Engineering. The complete series of lectures forms a two-years' course of instruction.

The following are the Synopses of the Lecture courses given, in alternate years, during the winter Session :—

I.

Principles of statics; couples; moments of forces; parallel and inclined forces; centre of gravity; moments of inertia; friction.

Equilibrium and stability of frames.

Strength of materials.

Applications of mechanical principles to combined structures, especially to roofs and bridges.

Earthwork and masonry; retaining walls and masonry arches.

Principles of kinetics; Newton's laws of motion; conservation and transformation of energy.

Application of the principles of kinetics to prime movers, especially to the steam-engine.

Theory of heat engines.

Practical applications of electricity.

II.

Principles of statics; couples; moments of forces; parallel and inclined forces; centre of gravity; moments of inertia; friction.

Hydrostatics.

Principles of Kinematics; Newton's Laws of Motion; Conservation and Transformation of Energy.

Hydrokinetics.

Arrangement and construction of waterworks for the supply of towns.

Drainage, ventilation, warming, and sanitary requirements.

Water-wheels, pumps, and turbines.

Mill-work and gearing; spur and bevil-wheels.

Efficiency of various modes of transmitting power.

Locomotives.

Elements of machine design.

Engineering works and factories are visited by the class, under the guidance of the Professor.

II. *Class of Geometrical, Mechanical, and Architectural Drawing.*—Instruction is given in the elements of Geometrical Drawing, the making of figured sketches from actual measurements, and subsequently in the design and preparation of Working Drawings for Structures and Machines.

All students are recommended to take the classes in Engineering and Drawing together.

The class in Drawing may also be attended with advantage by those who propose in subsequent years to attend the class of Engineering, as it is of great importance that students should be able to readily understand mechanical diagrams, and

to apply the graphic methods of calculation frequently employed by Engineers.

III. *Additional Courses.*—Short courses of Lectures on special subjects, and of an advanced character, are given from time to time.

IV. *Tutorial Class.*—A Tutorial Class, at which the questions proposed in a Weekly Exercise paper are discussed and explained, is held each week.

V. *The Fulton Laboratory of Mechanical Engineering* in which practical instruction is given in the processes employed by the engineer in the experimental determination of the physical and economical constants of materials, machines, electrical appliances, and prime movers, is open to students during the Session.

VI. *Engineering Field-Work.*—A course of Theoretical and Practical Instruction in Surveying, Levelling, Setting Out, and Calculation of Quantities, is given during the Summer Session.

The course consists of Lectures, and of Practical Work, as undertaken in the field and in the office, and occupies the whole of each day for about three weeks. The number of hours during which instruction is given is thus made to correspond to an ordinary course extending over a much longer period.

VII. A special course of instruction in Sanitary Engineering and Practical Sanitation, consisting of Lectures, Demonstrations, and Drawing, suitable for candidates for Degrees or Diplomas in Public Health, is given during each winter session.

The University grants the Degrees of *Bachelor* and *Doctor of Science*, both of which may be taken in the Department of Engineering.

The following course of study is recommended :—

First Year.—Mathematics (First Class), Geometrical Drawing, Chemistry, Engineering Field-Work, Geology (Summer Session).

Second Year.—Mathematics (Second Class). Natural Philosophy, Engineering, Drawing.

Third Year.—Natural Philosophy (Advanced Class), Engineering, Drawing.

If the student is sufficiently well prepared, some modification of the foregoing may be found desirable.

HERIOT-WATT COLLEGE, EDINBURGH.

This Institution was founded in 1821 by Mr. Leonard Horner, F.R.S. In 1851 it took the name of the *Watt Institution and School of Art*, and in 1885 the present title was adopted

when it was placed under the management of George Heriot's Trust, and was substantially endowed by the Trust. In 1886-88 the College was rebuilt and fully equipped with all apparatus and appliances for Technical Instruction.

The *Technical Department* includes classes for Mathematics, Physics, and Chemistry, and the Natural Sciences, as well as for Engineering and the Constructive Arts.

The Engineering course extends over two years, and consists of lectures, exercises, and demonstrations in the laboratories.

THE GLASGOW AND WEST OF SCOTLAND TECHNICAL COLLEGE.

This was founded in 1886, according to a scheme framed by the Educational Endowments Act, whereby several educational institutions, namely, Anderson College, the Young Chair of Technical Chemistry, the College of Science and Arts, Allan Glen's Institution, and the Atkinson Institution, were fused together and placed under the management of one governing body.

The main objects of the amalgamated establishment are declared to be—to afford a suitable education to those who wish to qualify themselves for following an industrial profession or trade, and to train teachers for technical schools.

With this object, regular courses of instruction have been organized, for which the Diploma of the College is granted, in the following departments—

Civil Engineering.	
Mechanical Engineering.	
Naval Architecture.	
Electrical Engineering.	
Architecture.	
Chemical Engineering.	
Metallurgy.	
Mining Engineering and Mining.	
Agriculture.	
Mathematics and Physics.	
Chemistry.	

The subjects of instruction in the first year are the same for all the courses; and are—

Natural Philosophy.
Mathematics.
Chemistry.
Drawing.
Workshop or Laboratory.

Candidates who have completed this course and passed the special examination at the end of the Session, should then select the Department in which they purpose taking their Diploma, and they will follow, during the second and third years, the courses corresponding thereto.

In their second and third years Engineering Students attend the higher classes in Mathematics, Natural Philosophy, and Drawing; also a course of lectures on Applied Mechanics (including the Elements of Construction), and lastly, courses of lectures with Office and Laboratory or Workshop Training in the department of study selected. Besides the examination in the subjects of the first year's course, candidates have to pass an examination in either French or German, and in either Logic, English Literature, or Political Economy, before they can be admitted to the final examination in the main subject of the department, which is partly written and oral, and partly practical.

The course for Civil Engineering comprises Lectures on (A) Roads and Railways; (B) Hydraulics; (C) Roofs and Bridges; (D) Engineering Geodesy.

That for Mechanical Engineering, treats first of the materials used, then of their manipulation, and lastly of Mechanical Design.

In the course for Electrical Engineering instruction is given in the method of testing the College Engine, Dynamos, Storage-Cells, &c.

Regular courses of instruction have also been organized in connection with the evening classes of the College, for apprentices and others engaged in daily work. For these courses junior and senior certificates are granted in the above and other departments of study.

Special prominence is given to Laboratory work, in Physics, in Chemistry, in Engineering, in Metallurgy, and in other courses where it can be introduced with advantage.

UNIVERSITY COLLEGE, DUNDEE.

This College was established nine years ago, and now forms part of the St. Andrews University. It is chiefly devoted to the modern sciences, and comprises a special Department of Engineering in which the lecture-hall, drawing office, and laboratory have been fitted up with modern appliances, and every requisite for experiment and research. The regular professorial lectures, and the work of the laboratory classes, are directed to a study of the theory and practice of both Civil and

Mechanical Engineering; while in the drawing office students are exercised daily in the practice of engineering drawing, in which instruction is given by an assistant lecturer. In the laboratory students join with the professor or the demonstrator in making practical experiments on the strength of materials, their elasticity, and other mechanical properties, the coefficients of hydraulic discharge, and in testing the efficiency of the gas-engine and the steam-engine under various conditions. The present equipment of the laboratory includes a Wicksteed testing machine, testing up to 50 tons in tension compression, shearing, and bending, with autographic recording apparatus for drawing diagrams of strain and stress; an experimental steam-engine, working up to 75 indicated HP., and arranged to work simple or compound, with or without a condenser, and with either surface or jet condensation; a high-pressure tubular boiler; a gas-engine working up to about 10 HP.; a set of machine tools; a mercury column for measuring pressure up to 250 lbs. per square inch, and for testing the accuracy of pressure gauges and indicators; a cement-testing machine; and a large number of minor appliances for testing and experimental work, in addition to dynamo electric machines and the apparatus of the Electrical Engineering Laboratory.

During the winter term a special course of evening lectures is given, in addition to the regular day classes, upon some branch or branches of Engineering. During the summer term of each alternate session, a few weeks are devoted to a course of lectures and field-exercises in surveying, levelling, and the setting out of engineering works. The field-work is therefore included in a two-years' course, but attendance during three years on the engineering and other science classes at Dundee is recommended as qualifying for the degree of B.Sc. in Engineering granted by St. Andrews University.

As regards the allied sciences, the college at Dundee comprises independent departments (with fully equipped laboratories) in chemistry, mathematics, and natural philosophy, including mechanics, kinetics, hydrostatics, physical optics, thermo-dynamics, magnetism, and electricity. The subject of electrical engineering is taken in connection with this department. The College session begins on October 13th.

IRELAND.

DUBLIN UNIVERSITY (TRINITY COLLEGE).

The ordinary Science subjects bearing on Engineering are well represented in this College; and there are, in addition, four special technical or "Professional" Schools, viz., for Divinity, Law, Medicine and Surgery, and Engineering.

The latter is thus described in the Calendar—

The School of Engineering was established in the year 1842 for the purpose of affording to such students as intend becoming Civil Engineers systematic instruction in those branches of knowledge, an intimate acquaintance with which is most useful to the Engineer in the practice of his profession.

While keeping this object in view, it has been deemed advisable to require that the student, during his Course in the School, should be a member of Trinity College, and subject to its regular discipline. He can thus at the same time avail himself of the advantages of a general University education, either as resident within the College or otherwise.

It should be observed that the school only professes to give instruction in those branches of science which are the foundation of engineering practice, and which are daily becoming more important with the increasing application of science to engineering. No College instruction can dispense with the practical training that is acquired in the routine of actual work, but it gives a greater value and a speedier comprehension of the experience thus obtained.

Admission to the School of Engineering is obtained by passing an entrance examination in Elementary Mathematics.

The Professional Course continues for three years, during which instruction is given, partly by Lectures and partly in Laboratories, and in the Field; being arranged thus—

First Year (Junior Class).

- Mathematics.
- Mechanics.
- Experimental Physics.
- Chemistry.
- Drawing and Practical Geometry.

Second Year (Middle Class).

- Practical Mechanics.
- Theory of the Steam-Engine.
- Applied Physics, Elements of Electrical Engineering.
- Chemistry (Analyses of Ores, Minerals, &c.).
- Elementary Geology.
- Drawing and Office work.
- Levelling, Surveying, and General Engineering.

Third Year (Senior Class).

Mineralogy, Geology, and Mining.
 Drawing and Office work.
 Levelling, Surveying, and General Engineering.

On concluding the senior year of his course, the student, after passing the final examination, will be entitled to receive a "Licence in Engineering" granted by this University.

If he has also graduated in Arts he will be entitled to proceed to the degree of "Bachelor in Engineering."

And after having been actually engaged upon engineering works for three years, he will be entitled to proceed to the degree of "Master in Engineering."

Honours are further awarded for special merit.

THE ROYAL COLLEGE OF SCIENCE FOR IRELAND, DUBLIN.

This establishment is under the Department of Science and Art, South Kensington, and is said in the Prospectus to supply—

As far as practicable, a complete course of instruction in Science applicable to the Industrial Arts, especially those which may be classed broadly under the heads of Mining, Engineering, and Manufactures.

The course of instruction for students desirous of obtaining the Diploma of Associate extends over three years.

In the first year the instruction is general, comprising—

Mathematics and Mechanics.
 Descriptive Geometry.
 Geometrical Drawing.
 Theoretical Physics.
 „ Chemistry.

In the second and third years the instruction is specialized under the heads of *Mining, Engineering, and Manufactures.*

In the Engineering Division the second year contains—

Drawing.
 Mathematics and Mechanics.
 Practical Physics.
 „ Chemistry.
 Mineralogy, Botany, and Zoology.

The third year comprises—

Applied Mechanics and Hydrodynamics.
 Mechanism and Thermodynamics.
 Mechanical Drawing, Engineering, and Surveying.
 Geology and Palæontology.

Programmes and directories can be had from the Secretary on application.

QUEEN'S COLLEGE, CORK.

This College, founded in 1845, has, in addition to the ordinary Scientific courses, a "School of Engineering," of the same character as those in other educational institutions.

The course usually consists of—

First Session.

Mathematics (First Course).
 Chemistry.
 Modern Languages.
 Geometrical Drawing.
 Office Work.
 Experimental Physics.

Second Session.

Mathematics (Second Course).
 Mathematical Physics.
 Mineralogy, Geology, &c.
 Physical Geography.
 Civil Engineering.
 Office Work.
 Field Work.

Third Session.

Mathematical Physics.
 Civil and Mechanical Engineering.
 Office Work.
 Field Work.
 Engineering Excursions.

Students can also, if they wish to do so, attend a course of Practical Chemistry in the Laboratory and of instruction in the use of tools under a carpenter in the workshop, to which will be shortly added a smith's forge. They may also attend the course delivered by the lecturer on Architecture. The school is furnished with a Cement-testing apparatus by Adge, a Thurston Testing machine, and a 30-ton Wicksteed Testing machine with automatic recorder.

There is also a *Colonial Department* with a course of two sessions, for the instruction of those who are about to settle in new countries.

A certificate of having passed through the above course satisfactorily is granted by the College Council, and the students may obtain, after due examination, in the Royal University of Ireland—

A Diploma in Engineering ; or
The Degree of Bachelor of Engineering ; or
The Degree of Master in Engineering.

QUEEN'S COLLEGE, BELFAST.

This College, founded in 1845, has a "School of Engineering," of a similar nature to that in the Queen's College, Cork.

It is also similarly affiliated to the Royal University of Ireland, where the same degrees may be taken.

QUEEN'S COLLEGE, GALWAY.

A similar description will also apply to this College.

INDIA.

UNIVERSITY OF BOMBAY.

Bombay was the first place where an attempt was made to give a systematic education to intelligent young men of native Indian extraction, with the object of fitting them to act as assistants on the public engineering works of the country.

A College had existed for many years, called the "Elphinstone Institution," where education was given to the natives in literature and science generally. The instruction was conveyed entirely in the English language, the pupils being only those who had already received a good elementary education. This College answered so well, and the young men showed such aptitude for scientific pursuits, that in 1843 the Government, who were just at that time beginning to think of exercising more activity in regard to the public works of the country, determined to try

the experiment of educating some of the pupils as engineering assistants upon them.

With this view, they directed the home authorities to find and send out a suitable person to undertake the educational duty; the matter was referred to the Institution of Civil Engineers in London, and on their recommendation one of their members, Mr. William Pole, was appointed to the post.

He went out in 1844; formed a class of young men, selected carefully from the most advanced pupils of the college, and gave them a course of three years' instruction, theoretical and practical. And although the subject was so strange to the pupils, and the general idea of College instruction in it was so new and undeveloped, the experiment was very successful. The class made, during their study, surveys having reference to the preparatory idea of the introduction of railways into the West of India, and at the end of their course, most of them entered, as proposed, into the public employ, and proved useful servants.

Mr. Pole was obliged by ill-health to leave India in 1847; but the work was continued, and its success led, at that date, to the formation of a special establishment for the same purpose under the Calcutta Government, at Roorkee, in the North-West Provinces. In 1854, the Bombay Engineering School was also placed on an independent footing, and removed to Poona.

A few years later the whole subject of education had acquired such magnitude, that it was determined to rearrange it in a more systematic manner, and in 1857 a University was founded in each of the three Presidencies, to which the whole of the Colleges and Schools of the district were affiliated, the Engineering Colleges among the number.

The University of Bombay embraces four Faculties: Arts, Law, Medicine, and Civil Engineering; and in the latter are granted the degrees of Licentiate and Master of Civil Engineering.

The instruction for this subject is given at

THE POONA CIVIL ENGINEERING COLLEGE.

This arose out of the School already mentioned; its object being to educate subordinates, chiefly natives of India, for the Public Works.

There are four Departments: the highest being a full education for the University degrees; the three others (as in Roorkee) for inferior grades.

Workshops are attached to the College, where the students receive practical instruction, and where work of various kinds is executed for the Government and the public.

UNIVERSITY OF CALCUTTA.

This was incorporated by Act of Parliament in 1857.

There are four Faculties : Arts, Law, Medicine, and Engineering.

In the latter it grants degrees as—

Licentiate in Engineering ;
 Bachelor in Engineering, and
 Master in Civil Engineering.

A large number of teaching institutions are affiliated to this University, in many of which scientific subjects are taught ; but there are two affiliated colleges specially devoted to the Engineering faculty, namely—

The Thomason College, and
 The Government Engineering College.

The following particulars will explain the nature of these:—

THE THOMASON CIVIL ENGINEERING COLLEGE, ROORKEE, NORTH-WEST PROVINCES.

This establishment was founded in 1847, by the Government of India.

It is designed to give Theoretical and Practical Instruction in Civil Engineering to "Statutory Natives of India" (either of English or Indian extraction), with a view to their employment on the Public Works of the country, according to their several qualifications, and the requirements of the Service.

There are three classes of Students, viz.—

The Engineer class.
 The Upper Subordinate class.
 The Lower Subordinate class.

ENGINEER CLASS.

Candidates for this must be between 18 and 22 years of age, and are selected by competition in an entrance

examination, which comprises languages, physical science, history, mathematics, and drawing.

The course of study extends over two years, and comprises ten separate subjects, namely—

Elementary Pure Mathematics.
 Mechanics and Conic Sections.
 Higher Pure Mathematics.
 Applied Mechanics.
 Civil Engineering.
 Drawing.
 Surveying.
 Experimental Science.
 Hindustani.
 Physique and Sports.

There is also a tour of inspection of engineering works, when opportunity offers.

Students who have satisfactorily completed their course, are given Certificates as Assistant Engineers, and a number of appointments, on the Engineer branch of the Public Works, are annually guaranteed to properly qualified men; in addition to these, certain subordinate positions are given as prizes.

UPPER SUBORDINATE CLASS.

This is intended for Non-Commissioned Officers of good character, to be recommended by their Commanding Officers.

They are educated with a view to appointments on the Upper Subordinate Branch of the Public Works Department, as overseers.

The Course of Study extends over two years, and includes—

Mathematics.
 Civil Engineering.
 Drawing.
 Surveying.
 Hindustani.
 English.
 Physique and Sports.

LOWER SUBORDINATE CLASS.

This is intended for young men between the ages of 18 and 22, who are trained to be sub-overseers.

The course is a year and a half, and includes—

Mathematics.
 Civil Engineering.
 Drawing.
 Surveying.
 English.
 Physique.

THE GOVERNMENT ENGINEERING COLLEGE, SÍBPUR.

This College was opened in 1880, and is under the control of the Director of Public Instruction, Bengal.

All classes of the community are admitted, and the courses are adapted to the requirements of—

General Engineers.

Mechanical Engineers.

Foremen, mechanics, and apprentices.

Pupils for the two higher classes have first to pass the University Entrance Examination; then they have to study four years in a theoretical course at the College, and a fifth year on practical work.

UNIVERSITY OF MADRAS.

This Institution is much like the two others.

There is only one Degree in Engineering given, that of Bachelor.

The instruction in this subject is given in the

COLLEGE OF ENGINEERING, MADRAS;

the curriculum of which follows pretty nearly the plan of those already described.

CANADA.

UNIVERSITY OF TORONTO.

In 1827 a charter was granted for a University at this place, under the designation of King's College. At a later period it was extended, combining "The University of Toronto" and "University College."

The University confers degrees in the Faculties of Law, Medicine, and Arts, and in Civil Engineering, the latter being called "The Degree of C.E."

The educational course is complete, in Science and Arts, comprising all the usual subjects.

Attached to this Institution is a—

SCHOOL OF PRACTICAL SCIENCE.

This was established in 1877. The students enjoy full advantage of the instruction given by the Professors and Lecturers in all departments of Science, and in addition, the School of Science includes courses of Engineering and Applied Chemistry.

Students are enabled to prosecute professionally—

Engineering.

Assaying and Mining Geology.

Analytical and applied Chemistry.

According to the Prospectus:—

The instruction in Engineering is designed to give the student a thorough knowledge of the scientific principles of the Profession, and also to afford such practical training in drawing and surveying as will make him immediately useful in the office and field.

The establishment of a Diploma for special qualification in Assaying and Mining Geology, apart from the knowledge of these subjects incidental to the course of mining engineering, is called for by the necessity which exists for the development of the mineral wealth of the province. Students who pass through the course necessary to obtain this diploma will have acquired the knowledge requisite for inspecting and surveying mineral lands, as well as the ability to report accurately on the composition and value of economic minerals generally.

Certificates in Surveying will be granted after due examination, which will have the effect of shortening the ordinary period of apprenticeship to a land surveyor, by the length of time covered by such certificates—one, two, or three sessions, as the case may be.

Students intending to become Mechanical Engineers will enter as special students, and receive instruction in the principles of mechanism, the theory of machines and drawing, together with such work in the civil engineering course as may be suitable for their purpose.

Students intending to become Electrical Engineers are admitted as special students, and will receive instruction in drawing, mechanical engineering, and electricity. The physical laboratory is furnished with a good collection of electrical instruments; and a separate room will be set apart for experimental work in this department. Special attention will be given to the subject of electrical testing. In connection with the physical laboratory there is a workshop, the power being given by a 4 HP. gas-engine.

Students who intend to pursue Architecture as a profession are advised to take, if possible, the regular course in civil engineering, as the instruction given in this course in the subjects of drawing, colouring, principles of construction (carpentry, masonry, and ironwork), strength, and other properties of building materials, flow of water and air, theory of heat, &c., will be as useful to them as to civil engineers. They may enter as special students if they please.

The Engineering course is arranged to occupy three years.

There are special courses adapted to Mechanical Engineering, Electrical Engineering, and Architecture.

There is another Canadian Educational Institution, "The University of Trinity College, Toronto," but it makes no special reference to Engineering.

MCGILL COLLEGE AND UNIVERSITY, MONTREAL.

This was founded under a bequest of the Hon. James McGill, and was erected into a University by a Royal Charter in 1821, amended in 1852.

The University grants Degrees, the Scientific ones being—

Bachelor of Applied Science.
 Master of Engineering.
 Master of Applied Science.

Several Colleges and Schools are affiliated to the University, but the most important instruction is given in the "McGill College."

There are five Faculties, namely, Arts, Applied Science, Medicine, Law, Comparative Medicine, and Veterinary Science. The Faculty of Applied Science is designed—

To afford a complete preliminary training of a practical as well as theoretical nature, to such students as are preparing to enter any of the various branches of the profession of Engineering and Surveying, or are destined to be engaged in Assaying, Practical Chemistry, and the higher forms of Manufacturing Art.

Five distinct departments of study are established, viz. :—

Civil Engineering and Surveying.
 Electrical Engineering.
 Mechanical Engineering.
 Mining Engineering.
 Practical Chemistry.

The study for each of these extends over four years, and is specially adapted to the prospective pursuits of the student.

The Lectures are comprehensive and complete, referring to subjects of the usual kind.

THE UNIVERSITY OF KING'S COLLEGE, WINDSOR, NOVA SCOTIA.

This College was founded A.D. 1789, by an act of the Provincial Legislature, chiefly through the exertions of the first Bishop of Nova Scotia, Dr. Charles Inglis. A Royal Charter in 1802 conferred on it the privileges of a University.

It confers Degrees in Arts, Divinity, Law, Science and Engineering.

The *School of Engineering* was added in 1871.

The course is described to be—

Framed with a view of giving the student a sound and thorough training in Mathematics, pure and applied, a comprehensive knowledge of Engineering and Applied Science, together with such practical experience in work connected with the profession of a Civil Engineer as it is within the scope of the University to afford.

The course of instruction extends in most cases over four years, and includes the usual subjects.

“Dalhousie College and University,” Halifax, though an important educational establishment, appears to make no special reference to Engineering.

AUSTRALIA.

UNIVERSITY OF SYDNEY.

The University of Sydney was incorporated by the Colonial Legislature in 1850, for “The advancement of religion and morality, and the promotion of useful knowledge.” There are four Faculties: Arts, Law, Medicine, and Science.

The latter includes a *Department of Engineering*. The study occupies three years, and comprises Lectures on the usual subjects.

Degrees are given in General Science, and specially in various branches of Engineering.

UNIVERSITY OF MELBOURNE.

This was incorporated by Act of Parliament in 1853.

In addition to the ordinary scientific topics of education, there are Lectures on special Engineering subjects; and the University confers the Degrees of Bachelor and Master of Civil Engineering. The course of study occupies four years, and the candidate is required to produce before completing his fourth year a certificate of having been engaged during twelve months in acquiring a practical knowledge of Engineering under an Engineer or Architect in charge of works, or of mining under a competent Mining Surveyor or Manager.

ADELAIDE UNIVERSITY.

This was founded by an Act of Incorporation in 1874.

There are Faculties of Arts, Science, Law, and Medicine.

There are "Engineering Scholarships," but there appears at present to be no special instruction in Engineering.

THE UNIVERSITY OF NEW ZEALAND.

This was established by Act of Parliament in 1870, and has power to confer degrees in Arts, Law, Science, Medicine, Music, and such other departments of knowledge, except Theology, as the Senate shall from time to time determine.

The University will be prepared in 1892 to issue certificates to students who have gone through a course of study at the School of Engineering and Technical Science at the Canterbury College, or at any other school or college of which the Senate may hereafter approve.

The course of study requisite for certificates in Engineering is to be on the standard of the course in the Canterbury College Engineering School, in Mathematics, Mechanics, Technical Science, Engineering, Surveying, &c.

Further information will be given at the session of Senate to be held in February, 1892.

APPENDIX B.

OPINIONS AND SUGGESTIONS ON ENGINEERING EDUCATION.

In the work published by the Institution in 1870, there were given some "Suggestions offered to the Council," and also some "Extracts from published documents," bearing on the subject of Engineering Education.

Many of these have no longer any force, in consequence of the changes that have taken place in the general views and practice. But there are some which are still valuable, as applying to the subject generally in all stages and at all times, and it may be worth while to repeat them here. Some remarks of a later date are also added:—

REPORT OF THE SOCIETY OF ARTS ON TECHNICAL EDUCATION.

(No date ; probably about 1865.)

The Committee came to a resolution, "That technical instruction should not, as a rule, be given in separate professional institutions, but in institutions established for general education."

They said:—

What is required is that students should enter on their pupilage as well instructed as foreign students enter the special schools of the Continent. This can be effected by existing colleges, if these institutions are willing to organize special courses of study, and found new chairs for professors of certain special applications of science.

This has now largely been done. The further views of the Committee are explained in the following extracts:—

When existing colleges have organized the proposed courses of study, and when the new schools, leading to those colleges, or giving analogous preparation for the scientific professions, have been established, it will be necessary that the proficiency of the students and the efficiency of the teaching should be tested by methodical examinations; and, in order that students should be induced, by a tangible reward, to present themselves well prepared for these examinations, it is desirable that diplomas or certificates should be granted for approved excellence. There would be serious objections to the granting of diplomas to civil engineers, architects, &c., if these diplomas were supposed to certify that, after a merely scholastic education, the students were ready to practise their professions, but there are no objections to certificates which simply attest that the student has attained such proficiency in his theoretical studies that he is fitted to enter on a practical pupilage with advantage to himself and his employer. The certificates will also be a valuable recommendation in early professional life, if they are granted with discretion. They might either

be granted by some one public examining body in each profession, or by the various colleges where the higher studies are carried on. The Committee prefer the latter plan, as less likely to lead to one monotonous system of teaching; but they feel that certain guarantees must be taken, lest a sort of Dutch auction should occur, in which the inferior schools and colleges would bid for pupils by granting certificates for smaller and smaller acquirements. Such conduct would no doubt bring its own remedy in time, but, to avoid the occurrence of the evil, the Committee consider that the examinations at each school and college should be conducted with the assistance of two independent examiners, one appointed by the Government and one by the leading professional institute belonging to the profession with which the examination was connected. These two examiners should also report on the proficiency of the students at the various institutions, and would thus perform the office of inspectors, without subjecting the professors of the higher colleges to any degrading supervision.

After this good scientific instruction, tested by examination, comes the pupilage in all cases, and after the pupilage it is desirable that voluntary public examinations should be held, with the view of testing whether the young men have really profited by their pupilage. This examination, which should be partly practical and partly theoretical, might be conducted by similar boards of examiners to those specified above; and diplomas, which would then express real proficiency in the several professions, should only be granted to young men of undoubted merit. Severe examinations of this type are conducted at Carlruhe and other large polytechnic schools on the Continent.

The above recommendations are an expansion and explanation of the resolutions:—"That it is desirable that the higher scientific instruction should be tested by public examination, and that the proficiency of persons who pass these examinations should be certified by diploma;" and "That the preparation for the businesses considered by the Committee is not sufficient until due scientific instruction has been followed by practical pupilage in efficient works."

When, however, a methodical course of study has been rendered possible for each profession, and examinations have been instituted for testing the proficiency of students, it will at first be difficult to fill the classes of the new schools, and to induce young men in any numbers to present themselves for examination. It is incumbent on all those who really believe in scientific teaching to prove their faith by giving a practical value to the certificates obtained by students. This can be done only by the employers of labour, who must at first act on faith only. Hitherto no class of young Englishmen, trained in the manner proposed, has existed. In order to induce the rising students to follow this methodical training, they must see that the few who take that course do find employment more readily than those who do not. The employers of scientific labour can give an enormous impulse to scientific training by showing a real preference for young men who have passed through the courses of study recommended. Thus engineers and architects ought to receive pupils more readily who are well trained; they might reduce their premiums for such pupils; they should grant free pupilships as rewards for very successful public examinations; they might give privileges in their professional institutes to the holders of diplomas. The Committee "recommend employers of labour and others in the habit of taking pupils, apprentices, and clerks, to give the preference as far as possible to those adducing evidence of the possession of adequate instruction in the sciences applicable respectively to their professions or occupations."

PRESIDENTIAL ADDRESS OF MR. (NOW SIR) JOHN FOWLER, BART.,
9TH JANUARY, 1866.¹

From the many excellent remarks on Engineering Education contained in this address, the following may be quoted as bearing on the subject generally:—

With respect to the special preparation of young men, between the ages of fourteen and seventeen or eighteen, several of the largest and best proprietary schools and colleges in this country have special classes and departments for the study of the applied sciences; and thence well-prepared pupils are annually sent out to commence their career with engineers, architects, and surveyors; but still the character of this special preparation, in its theoretical branches, is not considered quite equal to that of France or Germany for the Civil Engineer.

It is true that nearly all continental nations have an advantage over this country in the power which the nature of their government gives them of concentrating, in one recognised official school for the preparation of Civil Engineers, all the best available talent of their country.

This plan does not exist in our country, and on the whole we rejoice that it does not; neither does the inducement of Government employment form the chief stimulus to our exertion, for which we are also thankful; but at the same time no good reason can exist why the opportunities of acquiring theoretical preparation in this country should be inferior to those of the Continent: and I have the confident hope, from the anxiety which is now manifested to increase the ranks of our profession, and the desire to have the best possible preparation for it, that even in the theoretical branches we shall shortly have to acknowledge no inferiority to any other nation. In the practical branches we are admittedly superior.

In drawing attention, however, to a comparison between our own and other countries, let me be guarded against the possibility of being understood to suggest that this theoretical equality ought to be obtained by any sacrifice whatever of our undoubted great practical knowledge; indeed, on the contrary, I think that the attention to the greater opportunities which young Engineers in this country enjoy, by reason of the number and character of our new public works, than is attainable in other countries, should be constantly encouraged to the utmost possible extent, and that our old superiority as practical Engineers should be ever maintained.

EXTRACTS FROM A LECTURE ON "THE EDUCATION OF CIVIL AND MECHANICAL ENGINEERS," INAUGURAL ADDRESS DELIVERED IN THE UNIVERSITY OF EDINBURGH, 3 NOVEMBER, 1868, BY PROFESSOR FLEEMING JENKIN, F.R.SS. L. & E.

Describing the system of education in England, the Author says:—

Young men, at the age of about eighteen, enter the office of a civil engineer. Usually few questions are asked as to previous training.

¹ Minutes of Proceedings Inst. C.E., vol. xxv. p. 203.

Etiquette requires the engineer to show a certain reluctance to receive the pupil, and, in fact, the ordinary pupil is a sort of nuisance in an office, only tolerated in consideration of the fee which accompanies him. From personal experience I can declare, that most pupils are so ignorant of algebra, that they are not only incapable of working out a result for themselves, but actually cannot apply the simple formulæ which are given in engineers' pocket-books. The calculation of the solid contents of a wall is often beyond their powers. Their arithmetic is very shaky, and a knowledge of physics, chemistry, geology, or the higher mathematics is wonderfully rare. The men have too often chosen the profession from an idea that it is pleasant, and because, forsooth, it is guarded by no preliminary examination. Not even a pass-examination is required, and the ignorance of some pupils, especially in mechanical workshops, must be experienced before it can be believed. They really seem to think that a little turn for making toy-models shows a bent for mechanical engineering such as will justify them in expecting success.

These young men during three years have the run of the office or workshop, and if they are intelligent, towards the end of their pupilage often have opportunities of seeing actual work in the field, or of designing some parts of actual machinery, and of assisting in the erection of more or less important works. No one teaches them anything; but they have the opportunity of seeing how some actual work is done; they see just how much mathematics is absolutely required, and they pick it up. They see how workmen are managed, and learn their habits; they are brought into contact with the exact class of work which they will have to perform, and they know that unless soon they are competent to do this work, they will not have a chance of employment. The one point for them is, to convince their masters that they are useful, and hence, notwithstanding their ignorance at starting, the neglect in which they are left during their pupilage, the absence for opportunities for improving their theoretical acquirements, many of them do become useful men.

We ought to form some idea of what the work of a Civil Engineer is:—

As a civil engineer, the young man is called upon to design small works, such as bridges or culverts, according to some well-established type—little originality is wanted, and just so much theory as will allow him to make safely the slight modifications required to meet each case; he superintends the execution of work by contractors, and must know good from bad work when he sees it; he must have such a knowledge of mensuration as will allow him to certify exactly the quantities of work done by the contractor. He must be able to survey on occasion, to level with great rapidity and accuracy, and to set out work in the field. He must have such a knowledge of the world as will enable him to deal pleasantly and firmly with workmen, contractors, and proprietors on whose land the works are being constructed. Above all, he must be a thoroughly honourable man, wholly above suspicion of taking bribes from contractors, of cooking his work, of concealing any blunders he may make, or of absenting himself from his duties.

Colleges cannot teach young men all these things, and my own experience has confirmed the conclusion, that a gentlemanly man of fair education and intelligence, after working as a pupil for three years in a civil engineer's office, is, for subordinate positions as a civil engineer, a more useful man than the pupil of a foreign school.

For a mechanical engineer the case is different. The younger men in

factories have to design machinery frequently of one type, but nevertheless varying so much from year to year, that a sound knowledge of mathematics, mechanics, and physics, is of the greatest importance to them; consequently as draughtsmen or designers we find foreigners employed all over the country. And *a priori* I would rather engage a foreigner to carry out my ideas in designing a new machine than a young Englishman of equal standing, especially as most of the foreigners complete their education by working in a shop for a short period.

As they rise in their professions, engineers are called upon to display higher and somewhat different qualities. The civil engineer may be called upon really to design great works and novel works; and here Englishmen feel sadly the want of a sound theoretical training. But even in the higher walks of the profession, design and invention are required much less than is usually supposed. The leading engineer must be a man of good business habits, able to advise the directors of great companies prudently as to the probable cost and revenue of proposed works. He must have the head of a lawyer in drawing up specifications and revising contracts. He must be able to choose his subordinates wisely, and keep them in good discipline. In a word, he must be a man of great *Common Sense*.

As a mechanical engineer, or as a contracting engineer, a knowledge of trade, a keen eye for economy in details, and a thorough practical knowledge of the properties of the materials he employs, must be added to the above list of talents; and when we reflect how very few of the above qualities can be taught at colleges, we understand how it is possible that our engineers should justly take a high rank in the estimation of the world.

You will long since have anticipated my conclusion,—that *there is no reason for abandoning our system of apprenticeship or pupilage to substitute for it the foreign plan of large special colleges*, even if we could hope to create colleges of equal merit with those formed abroad.

But this conclusion, instead of leading us to sit down wrapped comfortably in a veil of blinding self-conceit, ought rather to urge us to work with the greater vigour at removing the acknowledged defects of the British plan. We have not to construct the whole edifice anew, we have only to put on the cornice-stone.

Our defect is the want of a good knowledge of the theories affecting our practice.

It must be admitted that of this knowledge we possess far less than is necessary. By dint of sheer hard thinking and repeated trials we somehow do solve most problems; and the plan of Brindley, who used to go to bed when he was posed, and think steadily for a day or two, is by no means a bad one. But our success costs a vast expenditure of money and of brain which could be turned to better purpose if we knew how to calculate the results to be expected from a given combination with some certainty beforehand. And not only does our ignorance cause much wealth to be wasted by the community on useless trials, but it prevents the trial of many new schemes, because the engineers or managers to whom they are submitted feel that they have no means of judging beforehand of the probability of success, so they, wisely in their generation, think they had better stick to the old plans, and in nine cases out of ten they are right; but the rejection of the tenth case is a dead loss to themselves and to the country.

How much theory, as it is called, does the engineer want to enable him to judge soundly and design correctly? Certainly much less than is given abroad.

I have no doubt that the *engineering student of average ability might acquire a sufficient knowledge of theory before his apprenticeship begins, or during its course.* The very entrance-examinations required by the foreign colleges are a proof of this. These examinations are passed by young men of seventeen, eighteen, nineteen, and if our pupils could enter on their apprenticeship as well educated as the foreigners when they enter their special schools, I am convinced that the British would in every respect be far superior to the foreign system. Our engineers would then start in life with a good knowledge of algebra, trigonometry, mensuration, drawing, the elements of physics and chemistry. The few who had the turn for higher mathematics could pursue their studies in after life, but all would be saved the weary time now lost in offices by zealous men trying vainly to understand the simplest formulæ, and gradually picking up through practice the power of mensuration, and of representing ordinary geometrical forms by mechanical drawing. In addition, it would clearly be of great advantage that they should, before being brought in contact with practical work, have had their attention drawn to the manner in which all these branches of knowledge are applied to the solution of practical problems. The manner in which estimates are made, specifications drawn, and contracts framed, can be indicated by special examples. Above all, it is possible to inculcate the true principles of economy upon the mind of the student, who should never forget that the object of the engineer is not to display his ingenuity by the production of ingenious devices, but to use his judgment and invention so as continually to endeavour to increase production at a diminished cost.

Mr. Jenkin also, in a letter to the Secretary of the Institution, adds the following observations:—It is out of the question that any college training should replace the system of apprenticeship; but it is most desirable that pupils should enter offices better prepared than at present, and that they should continue their theoretical studies during their apprenticeship.

We do not require special institutions or any large number of technical chairs but rather . . . the practical recognition of the value of scientific training by engineers who take pupils; and by admitting as pupils only those students who have passed certain recognised examinations.

FROM "SYSTEMATIC TECHNICAL EDUCATION FOR THE ENGLISH PEOPLE." BY THE LATE JOHN SCOTT RUSSELL, F.R.S. 1869.

The following extracts will illustrate the Author's views bearing on the Education of Engineers:—

Page 79.—I will now come to the practical matters which show directly the results of a technical education in the production of one of its chief objects—the creation of wealth. It is notorious that those foreign railways which have been made by themselves in the educated countries of Germany and Switzerland have been made far cheaper than those constructed by us in England; it is known that they have been made by pupils of the industrial schools and technical colleges of these countries, and I know many of their distinguished men who take pride in saying that they owe their

positions entirely to their technical schools. I find everywhere throughout their work marks of that method, order, symmetry, and absence of waste which arise from plans well thought out, the judicious application of principles, conscientious parsimony, and a high feeling of professional responsibility. In the accurate cutting of their slopes and embankments, in the careful design and thoughtful execution of their beautiful but economical stonemasonry, in the self-denying economy of their large span bridges, the experienced traveller can read as he travels the work of a superiorly educated class of men; and when we come down to details, to the construction of permanent way, arrangements of signals, points, and sidings, and the endless details of stations, we everywhere feel that we are in the hands of men who have spared no pains, and who have applied high professional skill to minute details. It is well known that many years before we would follow their example, the engineers of the German railways had introduced a system of constructing and of uniting to each other the iron rails of the permanent way, which made them cheaper, more durable and safe than those employed in England. Happily for our national reputation it was an Irishman who invented it, though its advantages had first to be appreciated in Germany before we would follow the example.

It is remarked by every traveller that the works of their railway stations are, when compared with ours, much more beautiful, convenient, and fit, both within and without; the construction of their trains, the proportions of their carriages, the fitness, convenience, and comfort of their internal arrangements, all tell to the disadvantage of ours, and the one thing in which our railways excel theirs is in high speed. Theirs, on the other hand, are economical in capital and high in revenue.

Page 199.— . . . *What Technical Education should we give to the Mechanical Engineer or Machinist?*—From the days of James Watt and Arkwright until now, comprehending the whole of the present century, the mechanical engineer or machinist has formed one of the most important classes of this country, and has conferred on it immeasurable benefit. It was the mechanical engineer and the manufacturer who, together, during the early part of the present century, while the whole of Europe was overrun by the curse of war, created wealth in this country so rapidly, as to enable her to struggle through a burden of expenditure to which there has been no parallel, and to come out of it prosperous and wealthy.

There are no occupations or trades concerning which there could be so little difference of opinion as to the practical importance of special technical education, as this class of mechanical engineer and machinist. Philosophers have defined man as the tool-using animal; but if the man of this century were defined, the "engine-maker" and "machine-user" would be his leading characteristic: it is the triumph of human nature in our time, that it has achieved the understanding of the forces of nature so completely, that whatever material service we wish to perform, we can always discover some elementary force in nature, willing to lend us its aid to conquer our difficulty, provided we will study its nature sufficiently to direct it into the way in which it can best serve our end. The steam-hammer of Nasmyth, and the steel ingots of Krupp, are symbols of the powerful yet plastic forces man wields, in his gigantic shape-compelling processes of manufacture. We may sum up the duties of a man of this craft by saying, that there is scarcely a process now performed by animal or man, which our engineers or machinists of the next generation may not be called upon to perform better and quicker by machines of their own creation.

Of the engineer and machinist it is therefore very easy to indicate the course of instruction; unluckily, much easier to indicate than to accomplish. He must master all the known powers of material nature: heat and cold; weight and impulse; matter in all conditions—liquid, solid, and gaseous; standing or running, condensed or rare, adamantine or plastic—all must be seen through and comprehended, by the master of modern mechanics. The same laws which govern the machinery of the heavens, he has to apply to the machinery of the earth; and the same exquisite mechanism which the Creator has used in the structure of his animals, the modern mechanic has to apply in the construction of his microcosms. The modern mechanic, who would be equal to his work, must be prepared to shape a tool and frame an engine for the execution of tasks which were never even dreamt of by the older mechanics.

. . . *What Technic Education should we give the Civil Engineer?*—The great public works of a civilised country have always demanded and generally received from its Government, earnest solicitude and forethought. In France, the civil engineers are the *élite* of the nation; the most distinguished pupils in the colleges throughout the country are promoted into the central technic institution of France in Paris; and out of this again, a selection is made of the most talented for the "*corps de génie maritime*;" for the "*corps de génie militaire*;" and for the "*corps de génie civil*," or "*ponts et chaussées*."

By the great public works of a country so much is gained or lost to the public well-being, that the most liberal measures are justified, if they succeed in providing for its service the profoundest knowledge, the most brilliant talent, and the highest skill. In the time of the Romans, Europe was covered with those wonderful roads which have been perpetuated to the present day, and are marvels of conception and execution. The correction of rivers and supply of waters to great cities, the drainage of marshes and the irrigation of plains, have developed the industry and created the wealth of populous countries; and it has depended almost entirely on the wisdom or folly of modern Governments, in the selection of their engineering systems, whether those great engines of commerce, the modern railways, have been given to a country at small cost, on a wise system of development, with gain at once to the capitalist, to the trader, and the Government. Where Governments have been wise, the railways have been well selected, cheaply made, economically and profitably worked. Where they have been reckless, ignorant, unwise, railways have been made at great cost, extravagantly worked, dear to the public, and unprofitable to the capitalist.

When it is considered that the telegraphs which now work the commerce of the world; the great lines of steam-ships which unite its most civilised portions; the railways which everywhere connect the populous centres of empires; the water supply; roads; ports and harbours; the direction, training and permanence of our navigable rivers—are all works involving enormous cost, involving the highest national interests, and requiring consummate knowledge and skill, it is plain that we may judge of the wisdom of a nation by the foresight and forethought it bestows upon the rearing, training, and selection of this *corps d'élite* or *corps de génie*; and it is therefore self-evident that, in a technical university, the pupils of this section must find a prominent place. For England especially, with her wide-spread dominions, it is evident that the youthful engineer should be prepared to find a sphere of usefulness in any quarter of the globe, and to carry with him a mastery of all the resources of modern science and skill.

FROM THE PRESIDENTIAL ADDRESS OF MR. THOMAS HAWKSLEY,
9 JANUARY, 1872.¹

On the subject of professional education I wish to say a few words, and I would address them rather to each one of the 200 Students of this Institution who may happen to be now present than to the Members who have acquired and who have usefully employed that peculiar knowledge by which they are severally known and distinguished.

To the Students, then, I would say:—1st. Of all things, don't attempt too much. 2nd. Keep up and augment your knowledge of mathematics and the applied sciences, especially of those sciences which are most needed in that walk of the profession which you have selected for your own path; but again, I say, do not attempt too high a flight, for if you do you will never become a practical man. 3rd. Do not let your French grow rusty, and acquire German, if your leisure and aptitude are sufficient for the purpose, because your future avocations may be in countries in which these languages are either habitually spoken or are in considerable use. 4th. Acquire in the office, and by the study of esteemed works, a knowledge of form and design. 5th. But bearing in mind that you will never become a practical Engineer on theory alone, take every opportunity which presents itself of becoming apt in surveying and levelling, and in the methods employed in the setting out of works; learn the uses and applications of tools; make yourselves able to distinguish a good material from a bad material, good workmanship from bad workmanship, sound ground from treacherous ground, good puddle from bad puddle, good mortar from bad mortar, and a good workman from a bad workman. This knowledge is not to be obtained in a school, a college, or an office, and cannot be learnt from books. 6th. Make yourselves acquainted with every description of plant, and all the appliances and contrivances which an experienced contractor employs for the purpose of rendering a paper design into a substantial construction. 7th. Keep brief treatises on geology and chemistry always at hand, for some acquaintance with these sciences cognate to Engineering is, in the present day, almost essential. 8th. Practise as much as possible the art of mental computation, for this will give you the means of almost intuitively arriving at determinations on questions of cost, and of at once seizing on the best of several alternative plans or methods. 9th. Be not afraid of soiling your hands or dirtying your boots, but be in every other respect—in thought, feeling, and conduct—a gentleman.

FROM THE PRESIDENTIAL ADDRESS OF MR. J. F. BATEMAN,
15 JANUARY, 1878.²

Much of this was devoted to the subject of Engineering Education. He makes many references to, and quotations from the volume on this subject published in 1870. The following passages may be extracted here:—

Page 5.—There is considerable individuality in the practice of most of our members. Circumstances to a great extent control our operations.

¹ Minutes of Proceedings Inst. C.E., vol. xxxiii. p. 333.

² *Ibid.*, vol. lii. p. 2.

Early engagements or opportunities do much towards fixing a man's future career. Some men have been principally engaged in the construction of railways, others in hydraulic engineering, many in mechanical construction. Some have devoted their energies to the development of the electric telegraph; others to gas-lighting, to armour-plating, to naval architecture, or to artillery; while not a few may be considered as purely scientific men, investigating the strength of materials, the laws of motion, the phenomena of light and heat, and the thousand other questions which have a bearing on practical engineering.

It is, in fact, the combination of theory and practice which makes the successful engineer. Engineering is but the embodiment of practical wisdom,—“the conjunction,” as Bacon calls it, “of contemplation and action.”

It was thought, combined with practice, which enabled Watt to perfect his invention of the steam engine, now little more than one hundred years ago. It was thought and practice which, in the hands of George Stephenson, led to the successful application of the locomotive engine. Thought and practice produced the electric telegraph. Indeed, though practical wisdom may be said to be the parent of almost all successful undertakings, it is especially due to the combination of sound theory with successful practice, and to the practical wisdom which is the result, that engineering owes its present high position, and has been able to contribute so largely to the material prosperity of the world. It is not, however, material prosperity only to which the engineer may lay claim. His works have carried civilisation into the most remote and barbarous regions. The steam engine, in its various applications, has knitted together the most distant nations; it has brought ignorance into contact with knowledge, heathenism with Christianity, and has extended the blessings of civilisation to every quarter of the globe.

Page 8.— . . . Still there can be little doubt, on a review of the whole question, that our young engineers are not always prepared by preliminary education as well as they might be, for their subsequent acquisition of practical knowledge. It is not because there are not institutions in this country where such knowledge can be obtained, but rather from a general laxity in the views of parents and guardians upon technical education. Special qualifications, and some of a very high order, are required to ensure success in our profession, and many young men enter it as pupils without these qualifications.

From a Paper on “The Use and Equipment of Engineering Laboratories,” by Professor Alex. B. W. Kennedy, read before the Institution December 21, 1886 :¹—

He believed that it was essential for a young engineer to obtain his practical training, in the ordinary sense of the expression, in a workshop. But the practical training of a workshop is incomplete even on its own ground, and there appeared to be plenty of room for practical teaching such as might fairly fall within the scope of a scientific institution, and which should at the same time supplement and complete workshop experience without overlapping it. In an ordinary pupilage a young

¹ Minutes of Proceedings Inst. C.E., vol. lxxxviii. p. 1.

engineer does not have much opportunity of studying such things as the physical properties of the iron and steel which he has to deal with, nor the strength of those materials, nor the efficiency of the machines he uses, nor the relative economy of the different types of engines, nor the evaporative power of boilers. These things, however, are only types of many others about which it is essential, not only that he should know something, but that he should form some definite working opinion. But they are all matters very closely analogous to those already treated in laboratory work in physics and chemistry. They involve simply the making of accurate measurements in the branches of physical science most closely related to engineering. Moreover they are useful to the student not only for their own sakes, but also as teaching the art of making experiments—or it may be simply called the art of accurate measuring—in matters relating to engineering science. They are, to a wonderful extent, suited to set the student free from the thralldom of the engineering pocket-book (making "every man his own Molesworth," as it has been put), by helping him to determine for himself, or at least to see practically how other people have determined, all the principal engineering constants, from the tenacity of wrought-iron to the calorific value of coal, or the discharge-coefficient of an orifice. Further, a healthy scepticism of uncritical generalisations, or of uninvestigated facts, is fostered by nothing so surely as by a personal and practical knowledge of what accurate experiments really are. From all these and other considerations it appeared to the Author that the kind of practical work which has been alluded to could be nowhere better given than at those educational institutions which endeavoured to teach young engineers the scientific basis of their profession, and following up this idea he gave in some detail, on the occasion to which he has alluded, a description of the function and work of an engineering laboratory.

REMINISCENCES OF GERMAN
UNIVERSITY LIFE

LECTURE DELIVERED ON THE 20TH APRIL, 1906
ON THE OCCASION OF THE

74th ANNIVERSARY OF THE

Hilbert Reading-Room and Library,
Secunderabad,

BY

DR. NISHIKANTA CHATTOPADHYAYA

LATE PRINCIPAL

AND FORMER PROFESSOR OF ENGLISH AND HISTORY

IN THE HYDERABAD COLLEGE,

AND NOW PROFESSOR OF

HISTORY AND POLITICAL ECONOMY

IN THE

RICHARDSON'S COLLEGE, MYSORE.

PRICE EIGHT ANNAS

REMINISCENCES
OF
GERMAN UNIVERSITY
LIFE.

FOREWORD.

The following lecture on "Reminiscences of German University Life" was delivered, in the first instance, on the 30th April, 1892, on the occasion of the 17th Anniversary of the Albert Reading Room and Library of Secunderabad with Mr. G. R. Irving C.S., the Assistant Resident of Hyderabad in the chair. Four years later, it was delivered again at the Framjee Cowasjee Institute Hall of Bombay, and had the advantage of being presided over by such a distinguished scholar and educationist as the late Mr. Justice Ranade undoubtedly was. At the end of the same year i.e. 1896, I had to deliver the same lecture over again before the University Institute of Calcutta when Sir John Woodburn—the present Lieutenant-Governor of Bengal—had not only the kindness to preside, but also to make some very kind and complimentary remarks about the lecture he had heard that evening. As the copies of this lecture printed along with two others, called "The Three Lectures," some years ago are now out of print, and as educational questions are just now being discussed from the Viceroy downwards to the village pedagogue with an amount of zeal and eagerness almost unprecedented in the annals of this country, it has been suggested by some well-meaning friends, that I should have my lecture on the "Reminiscences of German University Life" republished in a more suitable form and type, inasmuch as it imparts a vast deal of information about the German University system, all but unknown in India.

Besides, it is a matter of peculiar gratification to me, that most of the suggestions by far that have recently been made about the remodelling of our Indian Universities by scientific and educational experts like Professor Ramsay in his valedictory address in Bombay on "Higher Education and its Needs," or like Professor Geddes in his remarkable letter to an Indian friend, published quite recently in the columns of the "Pioneer," have held up the German University system as the type, the standard and the ideal

that we should endeavour to approach and imitate as nearly as possible. This, I repeat, is a matter of quite peculiar gratification to me as a German graduate, and I feel justly proud of our German Universities in general and of my *Alma Mater*, the Leipzig University in particular. In republishing, therefore, this lecture on the "Reminiscences of German University Life" I am contributing as much my humble quota of information to one of the most vital problems of the day in India, as I am discharging a filial duty to my dear old fostering mother—the University of Leipzig—who, like wisdom, has no need to be ashamed of her children, since she counts among the number names no less eminent and conspicuous than those of Leibnitz, Lessing and Goethe.

The problem of remodelling our Indian University system is a very important one. It is, in fact, "the problem of problems" of the day, and on its right solution depends to no small extent the future well-being of the countless millions that dwell in this vast and ancient land. As the Viceroy said in his excellent speech at the Educational Conference at Simla, September 2nd, 1901. "We are not playing with counters, but handling the life-pulse of generations." Reform and remodelling presuppose defects and shortcomings. What then are the real flaws, what are the actual charges that are brought against our University system in India? Let us consider these in detail, and try, if possible, to suggest some remedies:—

I. *That it encourages excessive cramming with a view to passing examinations and therefore cultivates memory at the expense of the understanding.*

But is not a certain amount of cramming for examinations almost unavoidable in any country, be it in India, England, or Germany? Is there less cramming, for instance, at Oxford where undergraduates often make use of "cribs," "coaches," and "keys" which our poor Indian students do not even dream of? If this process of cramming is carried to excess, as I fear it sometimes is, the true remedy lies with the University and the examiners. Let the University prescribe fewer and less pedantic books, and let the examiners set such questions as can only be answered by those who have thoroughly understood

what they have read. The evil complained of will be reduced to a minimum in a very short time.

II. *That knowledge is rarely pursued for its own sake, but chiefly with ulterior ends in view, such as securing a pass and a Government billet, and that there is hardly any inclination or capacity for original research.*

The first part of this charge is, no doubt, true, but it is somewhat inevitable in the peculiar circumstances of this country in the present transitional stage of its evolution to a higher type. As for the second portion, it is both false and unfair. Dr. J. C. Bose, and Dr. P. C. Roy, Mr. Paranjpe and Dr. Ashutosh Mookerjee have abundantly shown, I believe, what latent capacity for original research there is in the Indian mind provided it finds a fair field for its growth and cultivation. Let there be Honours courses and post-graduate scholarships attached to all our Universities; and in a few years the aspect of things will be greatly changed. Let our Government establish technical schools all over this country, let it multiply museums, libraries, laboratories, and research institutes to the best of its power and resources, and our Indian graduates will not only prove before a single decade has passed by, that they possess rare capacities for original research in all branches of science and industry, but they will also be able to strike out new careers and professions for themselves and earn a decent and independent livelihood. The irritation of our Government about the ill-educated and irrepressible *babu* who is always clamouring for appointments which have no existence, will be gone, and his place will be filled up by an ever-increasing host of theoretical and practical chemists, of physicists and electricians, of botanists and zoologists, of geologists and mineralogists, of machinists and mechanics *et hoc genus omne*.

In this matter, our Government with its vast resources can do a great deal, but our wealthy bankers, Zemindars and Native Princes can do vastly more. If a wealthy Parsee merchant of Bombay could give away thirty lacs for one single Research Institute, could not the millionaires and the territorial magnates of Bengal and of other Provinces do infinitely more by combining their resources? Could not our enlightened Native Princes like

the Barons and Electors of Germany, endow their own educational institutions with post-graduate scholarships and travelling fellowships and found museums, libraries, and laboratories for the promotion of successful research all over their vast territories? Certainly they could. And by doing so, they would only prove to the Supreme Government as well as to the whole civilised world, that "their revenues are not secured to them for their own selfish gratification but for the good of their subjects;—and that their *gadi* is not intended to be a *divan of indulgence*, but the *stern seat of duty*."* And in this regard, I could proudly point to the German Universities, which have really achieved wonders in scientific researches, as the best models to be followed and imitated as closely and as approximately as possible.

III. *That physical exercise in the shape of games and sports is not sufficiently attended to, and that consequently our Indian students break down prematurely under the high pressure of our University system.*

In this matter, we could hardly do better than follow the bright examples of Oxford and of Cambridge as far as is consistent with the climate of this country and the peculiar constitution of our students, although we should by no means neglect *gymnastics* properly so-called, particularly those forms of it that are indigenous to India. Our Indian club exercise is admittedly good; but there are certain points in our old system of wrestling which are excellent, and should, therefore, be duly revived and cultivated. By the way, could we not also add *rowing* as an out-door exercise for our University students, to such English games as tennis, foot-ball and cricket which they have already adopted? There ought to be excellent chances for this almost ideal form of physical exercise in a country abounding in broad rivers and beautiful streams. *Mens sana in corpore sano* should certainly be our motto.

IV. *That our present University education unsettles the moral and religious convictions of those who go through its curriculum. It makes them sceptics, agnostics and even theosophists!*

But is not the effect of University Education on the impressionable undergraduate, more or less, the same everywhere, and especially in Europe? As far as my experience goes, the under-

* Lord Curzon at Gwalior, 29th November, 1899.

graduates of Oxford and Cambridge, of Leipzig and Berlin were just as bad as our Indian students, if not far worse. During my time in Leipzig, when Arthur Schopenhauer was the *philosophe à la mode* and Ernst Hückel the prophet and the apostle of the new evolutionary creed, most of my fellow-students and especially those belonging to the Philosophical Faculty used to declare themselves openly as agnostics, or Buddhists who were passionately longing for “the joys of the blissful—the ineffable Nirvana!” To profess any faith in some of the accepted dogmas of popular Christianity was almost a slur on an undergraduate’s superior intelligence and on his *Kulturfähigkeit* (capacity for higher culture.) This period of doubt and enquiry, “of storm and stress” is, therefore, a necessary stage of transitional growth which all students of ardent souls and of enquiring minds must always go through, and it is unfair and inconsistent to gibbet our poor Indian Students alone, suddenly transported from the Egyptian darkness of antiquated prejudices and hoary superstitions into the bright Promised Land of Liberty and Light, for any want of reverence that they may occasionally exhibit towards what Bacon has justly called “The Idols of the Theatre.” On the contrary, we should rather sympathise with their doubts and difficulties, and do our best to help them. After all, is there not more real faith—more genuine piety—in such honest doubts, as Tennyson has put it, “than in half the creeds” we so loudly profess? Besides, is it possible to be permeated, so to say, from our very boyhood upwards with the thoughts and ideas of English literature without being considerably strengthened and elevated from a moral and religious point of view? Is it pretended that the poems of Wordsworth and Tennyson, (to take only two out of many), are not at least as *religious* in their essential tendency as any grand sermons ever preached from Saint Augustine to Spurgeon? Do not the novels of Scott and Dickens (only two out of many!) hold up to our youthful minds ideals of moral conduct as noble and lofty as any to be found in the lives of all the saints in the world? Certainly they do. Not only do they do so, but the morality and the religion such works of literature inculcate to susceptible minds are far more *human* and, therefore, far more real and practical in all their bearings on life.

It would perhaps be a great advantage in some respects, if we could really teach some definite and dogmatic creed in our Indian schools and colleges as is done in Eton and Harrow or in Oxford and Cambridge. But considering the multiplicity of religions, of sects and schisms followed in this vast continent, it is neither possible nor desirable. At all events, the Government of India which is irrevocably pledged to a perfect religious neutrality in its dealings with the natives of India, can absolutely take no initiative in this direction. Direct and positive religious teaching must, therefore, be left to those denominational institutions which have been lately springing up, or better still, to the parents and guardians at home.

V. *That our Indian University Education is far too exotic and outlandish, and too little indigenous and national.*

There is a good deal of truth in that, but can we help it? Although Macaulay has been very much maligned in certain quarters for his memorable Minute on Education of 1835, yet the fundamental principles he laid down 66 years ago were very sound *then* as they are almost equally applicable *now*. We could never do without European science, European history and European philosophy. Nor we could do without European literature of the best sort. By all means, let us study all the valuable classics to be found in Sanskrit, Arabic and Persian. They are our own, and we must know them thoroughly. But if we are to get right notions of men and things as they really are, if we are to realise that high ideal of education enunciated by Freiherr von Stein, which consists in "the equable and harmonious development of all our faculties"—if we are, in short, to march on the lines of true culture and progressive civilisation, then we must undoubtedly give the first place in our programme to English education and to European Science. "*Ex Oriente Lux*" may be perfectly true; but that Light has in the meantime so persistently travelled towards the West, that those who are really in earnest about basking in its life-giving and beneficent rays must go the same way as the Light itself has gone. Plato and Pythagoras may once have travelled into India for the sake of knowledge, but the modest Indian youth who aspires in these degenerate days to be a Plato or a Pythagoras of his own land must do just the reverse, that is

to say, must go either to Oxford and Cambridge, or to Leipzig and Heidelberg. ! When we have thoroughly acquired and assimilated all the Arts and Sciences of the West,—and it will be a good long time before we have done so—when we have transformed, so to say, all the learning of the West *into our own flesh and blood*, then and not till then, shall we be in a position to talk of “a true, deep and living development of Indian culture,” which Professor Geddes so graphically describes and enthusiastically pleads for. This Indian culture will not be a mere one-sided Oriental thing, but will be the glorious outcome ~~of a~~ harmonious commingling of two different, though parallel streams—one from the West and the other from the East—“a fresh and a homogeneous current” as Lord Curzon has beautifully expressed it, “with an identity and a colour of its own.”* This devoutly-to-be-wished-for consummation may yet be far off, but it is bound to come sooner or later, “in the unending spiral of evolution.” But it will come only, to use Professor Geddes’ fine metaphor, if we know “*how to utilise our vast ancestral inheritance,—to fertilise our ancient world—our Indian lotus-seed with the far-blown and the strangely active Western pollen.*” The West must, therefore, furnish the moving, the masculine and the active germ to fertilise the passive, the contemplative and the feminine East,—at least for generations yet to come. It must be a real marriage between the East and the West, somewhat similar to that of Faust and Helena (mediaeval and classic cultures) with the beautiful Cupid-like Euphorion (modern culture) as their child. When that beautiful Euphorion shall be, nobody can say; but in order that he may be at all, we must not reverse the parts which the East and the West have to play respectively in the consummation of this world-drama. If the East is to spring into active and vigorous life again, if she is to take her due and legitimate share “in the Parliament of Man, in the Federation of the World” which the poet dreams of, then she can no longer afford only to bow low in patient and deep disdain before the trumpet blast of modern Europe, as she probably once did before that of ancient Rome, and then plunge into her subtle but fruitless speculations again which pass for philosophical thinking. That will not do at all in this twentieth century after the birth of Christ. Since the

* Calcutta University Convocation, 17th February, 1900.

days when "the glory that was Greece and the grandeur that was Rome" have vanished from this world, some new and essential elements of life and progress have been infused into the constitution of our human society, and these must ultimately vitalise the whole East, including our beloved mother-land, India, if India and the East are to co-operate in the carrying out of that "far-off divine event" to which the whole world is slowly but surely moving.

"Gottes ist der Orient!
 Gottes ist der ~~Orient~~!
 Nord-und südliches Galände
 Ruht im Frieden seiner Hände."
 Goethe's "West-Oestlicher Divan."

6th October, 1901,
 Maharajah's College, Mysore.

NISHIKANTA CHATTOPADHYAYA.

REMINISCENCES OF GERMAN UNIVERSITY LIFE.

(Wahrheit Und Dichtung.)

IT is, I believe, generally admitted that the Germans are one of the most highly educated nations of Europe. There are some who even go so far as to maintain, that they are the most highly educated people in the whole world. I confess, there would be no surprise in holding even a proposition like this if we were to look to the roll of great scholars which Germany has already given to the world. For, what other nation could boast of such deep, accurate and varied scholarship such as is associated with the names of Leibnitz and Kant, Wilhelm and Alexander von Humboldt, Schlegel and Bopp, Hegel and Helmholtz? How to account for this deep learning, this phenomenal erudition? By some ethnic, climatic, political and religious conditions to which the Germans have been subject for at least 2,000 years. The Germans form, as I believe you already know, the western-most branch of that family of races, called the Indo-Germanic or the Aryan race. Now, one of the characteristic traits of this ethnic group is an insatiable thirst after knowledge, and an extraordinary capacity to acquire and accumulate it. In India, did not Sankhya and Sankaracharya know all that could be known in their days; in Greece, did not Plato and Aristotle carry all the lore of antiquity on their giant shoulders; and in comparatively modern times, is there anything that Bacon did not know, Newton did not calculate, Darwin did not observe, and Herbert Spencer does not speculate about? If the Germans, therefore, have displayed such phenomenal erudition, it is, in the first place, due to the fact that they belong to the same great family of races as the Aryan Hindus, the Greeks and the English. The climatic conditions of Germany have also fostered this ingrained, hereditary, *scientific* bias of the Germans. A climate rather bleak and cold,

a soil not particularly fertile or rich in precious mines ; vast primeval forests of beech and oak, stretching over enormous areas which have remained more or less the same since the days of Cæsar and Charlemagne ; huge formations of granite or basalt which enhance, no doubt, the grandeur of the scenery but do not add to the wealth of the country—these and similar causes have given a tinge of gravity, of heaviness, of sadness, of melancholy almost to the Germans, and have diverted their intellectual energy rather to the conquest of new realms of knowledge than to the subjugation of new kingdoms of material prosperity or political aggrandisement. But the cause which has done more than any other to give a new impetus to the intellectual life of Germany was the Reformation of Martin Luther. His translation of the Bible into the vernacular of his country ; his stirring appeals to his countrymen in the same vernacular to shake off the thralldom of priestly craft and spiritual slavery ; his lofty, heroic hymns trusting in God as a good shield and a strong castle in the midst of the most appalling dangers and enormous difficulties and chanted from one end of the land to the other by all classes alike and the last, though not the least, the example of his manly, martyr-like vindication of his own faith before the assembled conclave of Emperors and Kings, Cardinals and Bishops at the diet of Worms—all these causes combined to stir the national life *to its very depths and to infuse* a fresh leaven which has, in the course of three centuries leavened the whole lump. Not that there was any want of learning in Germany before Martin Luther. The cloisters of Nürenberg, Wittenberg, Leipzig and Eisleben had been famous for classical and scholastic erudition during the middle ages. What Luther's Reformation really did was to give a fresh impetus to the intellectual life of Germany in the same manner as the Reformation did for the rest of Europe, but above all, to initiate that system of mass education which has, for the last three centuries, brought the Bible and the three R's to the cottage of every German peasant and has made him what he is to-day : an honest and hard-working workman, and a sober and sensible citizen of the great Empire he belongs to. I may here incidentally observe, that a similar system of popular education following in the wake of a similar reformation in Scotland by John Knox

has also had somewhat similar results in that country whose inhabitants resemble the Germans in many more ways than either the English or the Irish.

The reformation re-organised the Universities on an altogether new basis. Patristic theology gave way to Platonic philosophy, while the hair-splitting subtleties of the schoolmen were superseded by the *Humanities* of Greece and Rome. Erasmus adored Socrates as a saint and wrote Latin like Cicero, while Melancthon combined in himself all the learning and elegance of an Athenian with the gentleness and charity of a Christian hero. The German Universities in those days were somewhat in the same style as the Universities of Oxford and Cambridge are to-day, that is to say, they were not merely teaching and examining bodies, but they also looked after the board and lodging, the manners and discipline of the *alumni* who were attached to them. In some old Universities, such as Leipzig, there still exists a Hall, but it is frequented by very poor students at a nominal fee. The majority of students take their meals in the hotels and restaurants outside the University limits. There is still a University chapel here and there, but German students, as a rule, go neither to the 'Varsity chapel, nor to any chapel at all, while the apartments that were formerly used for the accommodation of resident students are now used as lecture-rooms or laboratories. Their very architecture tells you, that they must once have been either cloisters for austere monks or cells for laborious scholars. Evidently there was a good deal more of College life *à l'Anglaise* in the German Universities of those days than there is now. I have purposely used the phrase *à l'Anglaise*, because there is still a good deal of College and University life in Germany, but it is based altogether on different principles. The German students in these days form into *Burschenschaften* (literally, *fellowships*) which is such a characteristic feature of the German University life. These *Burschenschaften* or clubs are always located outside the University limits. Each *Burschenschaft* has its own special laws or regulations and all the Burschen or Fellows who belong to it must implicitly conform to them. Woe unto him who out of negligence or impertinence dare violate one of the least of these laws! The penalties are severe and vary according to the grade of the offender, or the enormity

of his offence. For, there are various grades and classes in each club, and one must begin as a Freshman to rise to be a Master, or to make use of Masonic phraseology one must commence with the humble duties of a Warden to be crowned some day as a Right Worshipful Master or still higher. And this reminds me that there is also an element of secrecy and mystery in all these Clubs just as there is in the Masonic Fraternities. They have also their peculiar costumes, caps, colours, flags, coats of arms, passes and signs which are revealed only to the initiated under solemn pledges and secret penalties of all kinds. Those who belong to the same *Burschenschaft* must dine and drink, smoke and sing, fence, fight and even flirt together. Yes, fight also; for fighting and flirting go hand in hand, particularly amongst German students. Prince Bismarck when he was a student at Göttingen is said to have fought 32 duels in all. These duels are so frequent, that in some Universities like Leipzig, Bonn, and Heidelberg you often meet students whose otherwise handsome faces are disfigured by horrid scars—"the scars of honour"—as they are called. I once knew a big, burly, blonde and blue-eyed Teuton who, in a duel with swords had his aquiline nose clean cut off, and he had to go to an eminent nose-doctor to have it set on, in order that he might be able to breathe well, and to appear before his Dulcinea again, and he dubbed a second Don Quixote de la Mancha. I am told, duels are now less frequent than they used to be ten years ago. So much the better. One of the most ordinary penalties to which beginners (called "Foxes") are subject, consists in the shape of drinking as many glasses of beer as your senior or superior may be pleased to command. Eins, Zwei, Drei—one, two, three—there it goes tumbler after tumbler whether you wish it or not till you have actually gulped down a dozen or so at one stretch without even finding time to count them. Of course the German Lager beer, when it is fresh from the breweries, is very light, and scarcely does harm. Yet such penalties frequently repeated must have a deteriorating effect even on the best of constitutions. This simultaneous beer-drinking of the members of a *Burschenschaft* is always accompanied by a good deal of singing. These songs are loyal and patriotic, or comic and convivial. They are sung with an amount of lofty cheer and glee, the like of which I have neither

seen nor heard elsewhere. Some of them are in Latin, but the majority of them are in German, composed and sung by some of their best poets and musicians. These convivial gatherings which are called *Commers* would strike all Indian students with astonishment, as they would find it difficult to square such exuberant animal spirits with the dignity and the duties of serious scholarship. But there are more things in Heaven and Earth than are dreamt of in our Indian philosophy.

Another feature of the German University life are the *Vereins* or the Associations of which there are one or more attached to each Faculty. And as there are four Faculties in all, there must be at least four *Vereins* in each German University. But as a matter of fact, there are a good many more than that. The Philosophical Faculty alone has sometimes half-a-dozen *Vereins* attached to its different branches. The President of the *Verein* is generally a Professor, the Vice-President, a Private Docent, and the Secretary, a distinguished studiosus. The members meet once or twice a week, read lectures and dissertations, discuss their contents, and then wind it all up as usual, with *Commers*, i.e., with drinking enormous quantities of beer and singing vociferous songs until midnight. In this manner it brings the Professor and the pupils into personal contact, and fosters that *College life*, which is such a beneficial feature of the two Sister Universities in England, but which is totally wanting in our Indian Colleges and Universities. Until something is done to remedy this defect, our Indian Universities, I am afraid, must continue to be only teaching and examining bodies as they now are, and must fail to exercise that salutary influence on the manners and discipline of the students without which no education is complete, as manners make the man, and discipline forms the character.

In these *Vereins* or Associations you often come across eminent scholars who have acquired a European reputation by some original research or new discoveries. In the *Philosophischer Verein* which I had once the honour to belong to, I once met Professor Gustav Fechner, the author of a book called "Psycho-Physik" in which he has enunciated certain laws whose importance, as Dr. Martineau once declared, in the domain of what is now-a-days called Physiological Psychology is as great as Newton's Law of

Gravitation in solar astronomy. There was a lecture that evening, on the physiological and psychological aspects of vegetarianism by a medical man from Dresden and the old Professor seemed greatly interested in it. For, he was then going on for eighty, I believe, though still full of all the eager curiosity and the noble simplicity of a child. I had the privilege of escorting the old sage home and on the way he asked quite a number of questions about the Yogis and the *Fakirs* of India, and the marvellous feats they are said to perform. Seeing more of him by and by I came to discover, that he was quite a *mystic*, and had actually written a book called the "Zend-Avesta," a masterly exposition of Vedantic pantheism in the light of modern science. Professor Zöllner, the author of the "Transcendental Physics," and whose name is associated with what is called *the fourth dimension of space* used also to come to our *Verein*, though I never met him. I met Professor Wundt once or twice in our *Verein* and the celebrated author of the "Physiologische Psychologie" took part in our *Commers*, *i. e.*, in our drinking and singing with as much lustiness as if he was only twenty.

Gentlemen, it is this personal contact—this inspiration of being *magnetised*, so to say, by spirits far wiser and nobler than your own, that exerts such a tremendous influence on all young, susceptible minds and makes them to a great extent what they hereafter turn out to be.

The reason why the Philosophical Faculty has so many *Vereins* is, that it is by far the largest and the most comprehensive of all. For, it includes not only philosophy proper, but also philology, literature, history, ethics, political economy, mathematics and even the physical sciences. So that when you are told, that so and so is a Doctor of Philosophy you must not run away with the idea that he has taken his degree in mental and moral science or in logic and psychology. The chances are, that he has taken it in literature, in pure mathematics or in some of the biological sciences, say, in botany, zoology and physiology.

I must not, however, forget to mention that every *studiosus philosophus*, no matter what his special line of studies may be, must attend at least one course of lectures on logic and psychology during the first *Semestre* of his University career. This is

an initiatory stage which every student belonging to the Philosophical Faculty must pass through although the specific branches of his studies may be very different, for instance, chemistry, physics and magnetism, or Sanskrit, Zend and Greek, or English, French and German, or any other three subjects that are cognate or allied to one another. Three subjects are the *minimum*. You may take more if you like, but you cannot take less. For example, if you go in, so to say, for the ancient language tripos, you must take Sanskrit, Greek, and Latin, or Sanskrit, Zend, and Greek, or Greek, Latin, and Keltic, &c., whereas if you have the genius of Francis Bopp or of Max Müller, you may take the whole Aryan group, to wit: Sanskrit, Zend, Greek, Latin, Keltic and Slavonic. In the same way, if you aspire after the modern language tripos (there was no such tripos in the English Universities in my time, though there is one now, I am told), you must take either English, French, and German, or French, Italian and Spanish, or any other three-fold group, formed out of the dialects and the varieties of the three chief divisions of the modern European languages: to wit, the Romance, the Teutonic and the Slavonic, whereas if you have the wonderful memory of a Mezzofanti or a Magliabecchi, you may take them all and pass off as a second avatara of Mithridates. Subjects selected, you must now attend lectures for at least ten *semestres*, that is to say, for five years. You may do so in one University, or in two or even in five, spending one year in each University, provided all these Universities are affiliated as most of these Universities in Germany, Switzerland and Austria are. Or you may even attend ten Universities in five years, if it takes your fancy to do so. Each year is divided into two *semestres* or Sessions; and you may spend the winter in one place and the summer in another which is frequently done. It may suit you best to be in Leipzig or Berlin in winter, or in Bonn or Heidelberg or Zürich or Prague in summer. These summer Universities are often chosen not merely for the lectures of the distinguished Professors which they boast of, but also for the sake of the climate and the natural scenery of the places where they are located. Who would care to be choked with the dust and heat of Berlin in the sweet months of April, May, and June when he can hear the same topics discussed under the shadows of the castled crags

of Drachenfels or of the grand old ruins of Heidelberg, or on the lovely heights of the Züricher Berg? This system of attending several Universities has, therefore, not only the advantage of offering a variety of scenery and surroundings which must necessarily widen a student's mental vision, and enlarge his intellectual horizon but it also puts him in the way of hearing those Professors in the different Universities who are most eminent in the special branches which he has selected. For instance if one of the subjects of my studies be English literature, I might attend Professor Ulrici at Halle in winter, spend the summer at Heidelberg to hear Gervinus, spend another winter in Leipzig to hear Delius and the following summer at Zürich to hear Johannes Scherr and Gottfried Kinkel. The winter *Semestre* generally begins in October and ends in March, with a short recess for the Christmas, while the summer *Semestre* begins in April and ends in June. It is very short but it is very sweet. Then follows the long vacation which extends over July, August, and September, and during which German students often undertake long foot-excursions which is another pleasant feature of the German University life. And there are such charming places too in Germany for these long pedestrian tours. Those who are in Leipzig or Berlin may wander about the Harz mountains and follow the footsteps of Faust and Mephistophles on the Brocken; those who are at Bonn or Heidelberg may explore the valley of the Rhine which, in the picturesque variety of its natural scenery, the abundance of its legendary and historical traditions, and the wealth of its poetical and artistic associations is almost unrivalled, while those who are in South Germany may penetrate into the deep solitudes of the Schwarz Wald (Black Forest), or climb the heights of Tyrol or of the Rigi, or even go to that beautiful land of green myrtles and gold oranges—of cloudless climes and starry skies—which fascinates all poets and artists, I mean, of course, Italy. These pedestrian tours, as a rule, cost very little, especially on the Rhine. The only thing which the tourists carry about them is a pouch with some black bread and sausage or cheese, and a tin-case to collect rare specimens of plants, insects or stones which they may happen to come across. As they move along from one charming locality to another singing and shouting in the exuberance of their

youth and animal spirits they are welcome guests wherever they go, and the poor but hospitable peasants of the Rhine valley are ready to provide them with as much milk and butter, wine and grapes as they may need. One of the most charming reminiscences of my student's life in Germany is one such pedestrian tour in the valley of the Rhine in the summer of 1880. We started from Bonn; from Bonn we went to Remagen and Andernach by steam-boat; from Andernach we passed through the stone-quarries of Niedermending into one of which about 120 feet deep, we descended to drink beer cooled in blocks of natural ice; thence we arrived at the Lachersee with its beautiful monastery, holy and quiet as a nun, thence through the charming Brohlthal dotted with scenery as romantic as a poet's dream; from Brohlthal to Wahlporzheim, noted for its good red wines; from Wahlporzheim to the old castle of Altenhar whose ruins go back to the 10th century. I shall never forget those days—days marked round *with vermilion* in the tablets of my memory,—days of ecstasy such as occur only once or twice in a man's life but towards which he always casts a longing, lingering look behind ever afterwards. Oh! those days on the Rhine!—I would rather have a week of that life again, than all these years of Hyderabad existence:—

“ Better fifty years of Europe
Than a cycle of Cathay ! ”

I now proceed to give you a short sketch of how a degree is taken in Germany. As I have already said, there are four Faculties in a German University: Theology, Jurisprudence, Medicine and Philosophy, and consequently there are four degrees corresponding to these four Faculties. These degrees are: Doctor Theologiæ, Doctor Juris, Doctor Medicinæ, and Doctor Philosophiæ. This Doctor Philosophiæ is the German degree *par excellence* and is popularly known as Ph. D. It somewhat corresponds to the Arts' degree in the English Universities. A *conditio sine qua non* to obtain this degree is a *thesis* or dissertation, opening up a new line of research or adding some fresh knowledge in any of the three subjects you have taken up as your speciality. This *thesis* must consist of at least 50 octavo pages. It must be full of particular facts and figures which explain and elucidate the main theme, and may contain as few general remarks, as possible.

The style should be severely simple—each word a fact—and as devoid of rhetoric as it can be. Formerly, a *thesis* had invariably to be written in Latin, but now-a-days it is permitted to foreigners to write in German, or even in English. The chief point about a *thesis* is, that it should add some fresh knowledge—be it ever so little—to the stock of European Science and be accepted as such by the Faculty. A Yankee friend of mine from Boston, who was a student of Natural Science, wrote a *thesis* on a variety of lice (Blattläuse) which have their *habitat* in certain species of dry leaves, and took his degree. Finding him one summer evening busily engaged in sifting, selecting and searching for the cherished food of his thoughts, I got rather impatient and hinted, how much better would it be in such a beautiful twilight to take a long walk in the Rosenthal (a charming park near Leipzig) or to read Goethe and Schiller rather than hunt after bugs and lice as he was doing. Fancy, said I, coming all the way from Boston to Leipzig to do this sort of dirty work and to go back to America without reading Goethe's "Faust" or Schiller's "William Tell"! (For my friend knew very little German and did not care for poetry at all.) This launched us into a discussion about the comparative merits of the study of Science and Languages in which he, of course, took the side of Buckle and Spencer, while I stood up for Matthew Arnold and Max Müller as resolutely as I could. "Study of languages," said my uncle Sam, "has no scientific value; it may have a moral value, if you like," and as Science alone is progressive, and morality more or less stationary, so this latter *est une quantité négligeable* and may be conveniently left out of account. I did not quite see my way out of his premises and propositions although my intuitions secretly rebelled against them. I could by no means lead myself to believe, that hunting after bugs and such uncanny things on a beautiful eve of May could be more useful or profitable than reading Goethe's "Iphigénie," or Schiller's "Braut von Messina" sitting on the velvet lawn of soft green grass, and breathing fresh ozone and inspiration under the hoary oaks of the Rosenthal. But this is only by the way. What I mean is, that a *thesis* must contain bit or bits of information entirely new (even though these be no better than bugs or lice) and strike out an altogether new vein of thought and speculation. A book of Essays full of genera-

ities would not be accepted as a *thesis* even though the essayist were an Addison or a Macaulay.

But before your *thesis* is accepted, and you are let in for the other tests you must, in the first place, prove to the satisfaction of the Senate and the Rector of the University, that you have kept at least 10 terms in one or several of the affiliated Universities, that you have during each *semestre* attended the *minimum* course of lectures prescribed by the University laws (six lectures, I believe, is the minimum), that there has during these five years transpired nothing against your moral character, and that you guarantee as a gentleman and a Christian (or a Buddhist, or a Hindu or a Muhammadan) that the *thesis* is entirely your own work, the product of your own industry and investigation. These preliminaries settled, the Deán of the Faculty you belong to circulates your *thesis* amongst the Professors, each of whom gives his own individual opinion about it. This may take a month or even more. If the majority of the Professors pronounce in your favour, you are informed that your *thesis* has been accepted by the Faculty, and that now you will be permitted to go through the other oral and written tests. For these dates are fixed: and it rests partly with yourself how soon or how late these tests are to be. You may take two months if you like to go through it all. The tests that follow the *thesis* are mostly written, except one, which is oral. You have to write your answers to these tests in the *Aula* or the Senate Hall, and if the questions be such as need copious references, you are even allowed to make use of the University library. After you have passed through all these various written tests on all the three subjects and their collateral branches, you arrive at the last but by no means the least of the test you have to undergo before you are dubbed a Doctor of Philosophy. This examination is held *viva voce* before the assembled conclave of all the Professors and even of perfect strangers of learning and distinction, all of whom have a right to put to you any questions they like. Even ladies grace such occasions with their benign presence, if the *viva voce* refers to history or to *belles lettres*. One of the questions put to me on this occasion was: '*The influence of English thinkers on the life and philosophy of Voltaire,*' when I poured in such a copious flow of information, that my examiners,

were evidently gratified, while one of my written tests on English literature was nothing more nor less (fancy!) than *Macaulay as an Essayist and a Historian*. After having thus passed through the cross-fire of questions and interrogatories fairly unscathed, I was very politely asked by the Dean of the Faculty to retire for a while into the adjoining room till I should be sent for. And so I did retire but with a beating heart and a bounding pulse, knowing very well, that within those few moments, the balance of my fate would be struck and it would be decided once for all whether I was to be a Doctor Philosophiæ or not. At last, this state of anxious suspense came to an end, and I was called in. I read at once in the face of my tormentors that the three weird Sisters had for once decreed in my favour. The assembled concave rose as I approached, when the Dean in grave, sonorous accents announced to me the exceedingly welcome news, that I had gone through all the oral and written tests with great success, that they had decided to award to me *the highest honours (summa cum laude)* which a German University can confer on a successful candidate. The other two grades are *rite* or ordinary, or a *pass* as it would be called in Oxford and Cambridge, and *cum laude* or with praise.

The Dean concluded his speech with some very flattering remarks about the wisdom and learning of the great race from which I had sprung,—that the *Sramanes* of Arrian and the *Germanes* of Tacitus formed the remotest branches of the same great Indo-Germanic family, and that consequently there was a good deal of spiritual sympathy and intellectual fellowship between the two kindred races, although the Germans had neither colonial nor political interests in India—and that after my return to the “Fluren des Ganges,” *i.e.*, “the plains of the Ganges,” it should be the chief duty of my after life to be an interpreter of German thought to my countrymen, and of Indian thought to the Germans and the Europeans. *Tathistu*, that is to say, *Amen*, said I with all my heart though nobody else heard it. They then one and all very cordially shook my hands and wished me a *bon voyage* and a happy return to my friends and relations. Thus probed and assayed by various retorts and reagents I received at last the much

coveted *Hall-mark* of the University which consists only of three letters and is called a Ph. D.!

This assaying and hall-marking over, the most agreeable part of this degree-taking has yet to be gone through. As a rule, a successful *studiosus* gives a *Schmaus* or feast in which not only the Professors and the Private Docents, his personal friends and familiar *Burschen* are asked, but also his fair cousins and other young lady-friends with their inevitable mothers and aunts. This *Schmaus* usually takes place in the big hall of some hotel and restaurant, or if he be a Chor-student, *i.e.*, if he belongs to any of the *Burschenschaften* I have described above, in the big hall of the *Burschenschaft* itself, decorated with the arms and flags, caps and colours peculiar to that fraternity. Of course, there is always some extra decoration and special adornment of the hall on such occasions by the lady-friends of the new Doctor. The banquet begins at 8 o'clock in the evening or even earlier. Then "across the walnuts and the wines," begin toasts and speeches which seem to have no end. It is superfluous to add that the new-fledged Doctor is the centre of all attractions, and the theme of all praise. Panegyric follows on panegyric and eulogy on eulogy. He is lauded up to the Seventh Heavens. He is called a Korypheus of Science, a Phoenix of learning and a Sphinx of Wisdom. He is another Leibnitz, Humboldt or Goethe (all these men belong to the Leipzig University, whose Aula or Senate Hall is adorned with their busts). If he be an Asiatic and a Hindu, he is probably called a *Sinkhya*, a *Sankarâchârya*, a *Buddha*, a *Kalidâsa* or even a *Vishnu*, while those of his fellow-students who are of a more scientific turn of mind call him a *rara avis*—and "a black swan" ("ein schwarzer Schwan") which is, of course, followed by loud peals of vociferous laughter. This goes on till midnight or still later, when dancing begins. Here, again, the new Herr Doktor is the cynosure of neighbouring eyes, the observed of all observers. All fair faces are wreathed in sweet smiles towards him. And as the music rises with its voluptuous swell, soft eyes look love to his eyes which young and impressionable as he is, speak again. Dance after dance follows till the fairy scene is brought to a close by a stirring waltz which is the national dance *par excellence*. The grey streaks of early dawn are already

visible in the sky, and even the best friends must part at last, though undoubtedly "Scheiden and Meiden thut weh!" parting and farewells are so sad!. And now after all these toasts and speeches, songs and waltzes, there can no longer be absolutely any further doubt whatsoever, that our *Herr Studiosus* has at last become a Doctor Philosophiæ :—

"And so say his sisters, his cousins and his aunts."

A certain number of copies of the *thesis* is printed at the Doctor's expense, of which some fifty copies are kept by the University where you graduate, and fifty more are distributed amongst the different Universities. There are altogether some thirty-five Universities, I believe in Germany, Austria, and Switzerland (Zürich, Basel and Bern), some six or seven in Austria, and the rest in Germany proper. They are affiliated, and when you attend any of these Universities your lectures are counted, and your terms recognised. These German Universities are, as a rule, endowed institutions and entirely independent of the Government. In fact, they would greatly resent any attempt on the part of the Government to patronise them or to interfere in the freedom of their actions. Some of these Universities like Leipzig and Heidelberg are very rich, having been munificently endowed by kings, princes, and noblemen for centuries and generations. They have often lands and estates attached, whose revenues not only cover their own expenses but even leave a margin of profit which annually adds to the accumulated University stocks. These Universities are thus petty republics in their own way, choosing their own President who is called the Rector (corresponding to the Master or the Provost of the English Universities) : the Deacons of their various Faculties, their own Professors and their own Private Docents by a majority of votes. Everything connected with the University is decided by the Senate with the Rector as its President. There is also a *Universitätsgericht* or a University tribunal where students who are not amenable to ordinary Law Courts are occasionally hauled to receive the just punishment of their light peccadilloes or serious offences. Of course, there is always a King or a Minister who is elected as the Chancellor, but he has very little to do with the practical working of the administration, and appears only on State occasions somewhat as the

Duke of Devonshire does at the Convocation of the Cambridge, or the Viceroy at that of the Calcutta University.

As I have just hinted, the Professorial or the teaching staff is divided into three grades: to wit, (1) Ordinary Professors, (2) Extraordinary Professors, and (3) Private Docents. It is from these Private Docents that the other two higher grades are generally recruited. As the name implies, a Private Docent was a private tutor or "coach" in former days. Now-a-days, he forms the lowest rung in the professorial ladder. He is the tadpole, so to say, out of which the other two stages are evolved in the metamorphoses of a German Professor. He is usually a fellow and a graduate of the University. He draws very little pay, and sometimes no pay at all. He has mostly to live on his own hook or by his own wits, as the phrase goes, at the same time that he delivers his lectures every *semestre*. He may just make a little money out of the fees of his own pupils, but these, are sometimes so few and their means often so scanty, that he must very frequently console himself with the simple luxury of doing good to others without any remuneration at all. His is, indeed, a very hard life during those years of early apprenticeship. He must early practice the virtue of "plain living and high thinking" to keep the wolf from his door. Thank God, this is not so hard in his dear Fatherland as it would be in England or elsewhere. Living in Germany is relatively much cheaper, and small means go a far greater way there than in any other European country that I know of. Besides, the popular ideal of a Professor's kitchen and wardrobe is so modest, that there is no temptation to go in for show or extravagance where everybody lives a simple, homely life. But our private Docent need not tarry long in this tadpole stage of his existence. If he be of the right species, he will soon develop into the next stage, *i.e.*, into a half-frog and a half-fish with only the hind legs and a big tail attached, which exactly corresponds to a *Professor Extraordinarius* of a German University. His tail indicates that he still belongs to the lower organisation, while the two legs show unmistakeably that he has now higher powers of locomotion—in other words, that he draws more pay. A few more years of patient toil and persevering industry, and he

has evolved into a *bona-fide* frog with four legs *minus* the caudal appendage, in other words, into a full-blown *Professor ordinarius*, who draws the highest pay in his profession without any of those superfluous adjuncts, such as journalism or private tuition with which in former days he used to make the two ends of his domestic economy meet. But even then the monthly salary he draws is very moderate compared to the English and other University rates. Even then he would find it hard to breathe freely, and to hold his head above water in a rainy day, particularly if he has taken to himself a mate, and has sweet little tadpoles croaking about! Lucky, if he has married an heiress, and has not given large hostages to Fortune! Lucky, if he has the golden gift of the gab, and can draw large audience by his eloquent discourse! Lucky, if in addition to his special monographs and scientific *memoires*, he has written such books of general interest as bring him in an annual dividend as sure as British consols or French rentes! Lucky, if his reputation as a scholar and his fame as an author have spread so far as to draw pupils not only from the other Universities of Germany and of Europe, but also from the most distant quarters of the globe, from Greenland's icy mountains to India's coral strand! Such lucky Professors often draw large audiences, by which I mean two to three hundred pupils each *semestre*. Professor Ernest Hæckel at Jena, lecturing on Darwinism, used to draw that number each time, while Professor Johannes Scherr at Zürich, lecturing on Goethe and German Literature, would command an equally big audience. In the beginning of this century, Fichte, it is said, used to draw as many as five hundred or more to his lectures on transcendental philosophy and the Kantian Categories. But then Fichte was not only a great orator and a great philosopher but also a high and noble character, one of the highest and noblest in fact, in the whole range of philosophical literature. There were so many who must have come only to have a glimpse of him. Even granting, that a German Professor fulfils all these conditions, and is as great a success as he can be, yet the remuneration he draws for his undoubtedly heavy work is very moderate, indeed. Gentlemen, I know no other country in the world where a similar class of men undergo such severe mental labour and do so much hard and truly

useful work on their own special lines on such cheap terms as these German Professores, particularly the *Professors extraordinarii* and the Private Docents. Or if there be still such a class of men anywhere, it *is* or rather it *was* in this country; for such men are now gradually dying out. I refer, of course, to our old-fashioned Pandits and Shāstris who not only took no fees from their pupils (and in this they went even a step further than the German Professors), but actually lodged and boarded them for years without any remuneration at all. They regarded it as mercenary and mean to impart knowledge for the sake of money. Besides, the relations between these Shāstris and their scholars were very different from those of a modern pedagogue and his pupils, from those, for instance, of an Ichabod Crane and his obstreperous urichins! The Adhyāpaka or the Master of a *tól* as these Sanskrit Academies were called, ~~was~~ not only the school-master but also the *Guru* or the spiritual guide of his flock. He not only taught them Grammar and Rhetoric, Logic and Philosophy, but also *Brahmavidya* or morals and spiritual science. He not only trained their minds, but also cultivated their intuitions and guided them to the highest objects of thought and contemplation. He was their Preceptor, their Proctor, and their Padre all in one—their guide, philosopher and friend in every sense of that rather hackneyed phrase. In return, the pupils treated their *Adhyāpaka* with all the deference and veneration due to a father, and his wife and daughters as their mother and sisters. Rudeness or impropriety towards one's *Adhyāpaka's* wife or daughters was counted as a heinous offence by the great law-givers. For, wasn't he their *Upādhyāya* or *Achārya*, *i e.*, their spiritual father?

Gentlemen, I venture to think, that there were certain elements in those old-fashioned Sanskrit *tóls* which were excellent, and which duly revived, that is to say, embodied and incorporated into the present University system according to our altered conditions, would be highly beneficial to the present and the future generations. Such a measure would, in my opinion, fill up some of those gaps and remedy some of those flaws which so greatly mar the value of that education which we have been receiving for the last thirty years or more. Even the best friends of the Indian University system are of opinion that the coaching and cramming

system of passing examinations that is now in vogue, the almost exclusive attention devoted to the intellectual faculties and particularly to memory, the want of personal contact and of mutual sympathy between the Professors and their pupils, in one word, the total absence of that College life which forms such a characteristic feature of the German and particularly of the two sister Universities in England, all combined have produced results which are rather disappointing and even disastrous. We have lost, or are about to lose some of the best traits of our Indian character: our piety, our reverence, our loyalty, our good breeding, and even our hospitality. We very often go to the other extremes of thought and feeling, and frequently write and talk about religion, politics and society in a manner which leads people to believe as if there was no longer anything sacred to us. We emulate the glories of Troilus and Thersites, and take pleasure in counting the nods of Homer and the trippings of Odysseus. Most of us have become critics and sceptics, orators and bombasts. I should not be at all surprised if some of our Indian graduates should turn out to be Nihilists and Communists by and by. Some of them do not seem to be very far from that stage even now. Most of them are, however, better than their philosophies; otherwise, their philosophies, carried to their extreme logical consequences, would certainly land them into Nihilism and Communism. As a rule, we are prone to believe that we understand a thing because we can criticise and find faults with it, totally forgetting that nothing is easier than mere fault-finding which passes for criticism. There are spots in the sun, and anybody can detect them with a telescope of ordinary power. There are faulty measures in Shakespeare, and every school-boy is able to find them out, if he will. This spirit of harsh and rabid criticism which is so rampant now-a-days in the clubs and debating societies of this country is, I believe, greatly due to that one-sided intellectual education which has been imparted to our boys—which strengthens the minds without cultivating the feelings and the intuitions which form the basis of our moral nature. Something must be done to remedy this growing evil. In Bengal, where the necessity is greater than anywhere else, a good deal is being talked and written just now about the Higher Moral Training for

young men. With his characteristic energy Sir Charles Elliot has already taken up this important question and has indited some resolutions, which, if properly carried out, are sure to serve as an effective check and a successful barrier. The latest of these resolutions is a liberal grant to promote and resuscitate the *tôls* or the old Sanskrit Academies of Bengal, which will not only lend a fresh impetus to the revival of Sanskrit learning and literature, but also supply some of those deficiencies which so greatly neutralise the good effects of the high education which the Government of India has been so liberally giving us for the last half a century. Nay, I would go even a step further, and establish English Colleges more or less on the *tôl* system, adapted to our present needs, and place them under men who are not only good scholars, but who are at the same time able to command the respect and even the veneration of their pupils by their superior birth, high breeding and higher character.

Let me now say something about the physical training of German students. The Germans believe just as Englishmen that *mens sana in corpore sano* is the end of all education, that without the due exercise and the normal growth of all our limbs and muscles, of all our senses and organs, no man can ever get at that ideal of complete education which consists in "the harmonious and equable evolution of all our powers." I think, the Hindus should also hold the same view; for their best poet Kâlidasa says:—

Suriramadyam khalu dharma sâdhanam, that is to say, "the first duty of Man is to cultivate his bodily powers." I have already referred to the frequent fencing-matches and the long pedestrian tours of the German students. Then there is *skating* in winter and dancing all the year round. Dancing is by no means such an utterly frivolous pastime as most of you take it to be, I mean, of course, dancing *anglicè*, and not that "diabolical debauch—called nautch" which so greatly shocked the Puritanic sensibilities of the Rev. MacPherson of our friend Alif Cheem. Dancing not only gives sufficient exercise to the lower limbs, but also imparts a certain agility to the gait and the whole system which is so essential to a finished gentleman. I remember once having heard a dancing master in Europe say, that nobody could really walk with grace who had not had some lessons in the mys-

teries of his favourite art. But the physical training *par excellence* which all German students have to undergo are drill and gymnastics: drill, as soldiers, inasmuch as all Germans have to serve their Fatherland for at least one year, if not three. The gymnastic exercises are carried on in what is called a "Turnhalle" or gymnasium. There is one or more of such gymnasiums in every University town. They came into existence in the beginning of this century, and were, I believe, chiefly due to the efforts and the initiative of that great statesman and minister Freiherr von Stein—the predecessor of Prince Bismarck. Prince Bismarck is not only the continuator of the reforms which von Stein initiated, but is himself the most consummate product of his predecessor's policy and statesmanship. For, it is well known that Bismarck in his college days was not only distinguished by his love of historical studies, but was equally pre-eminent in all athletic feats which have made him the giant he looks. I shall never forget the impression which the stalwart forms and the gigantic features of the Emperor Wilhelm and Prince Bismarck made on me when I beheld them for the first time at Leipzig. They reminded me of the heroes of the "Gudrun" and of the "Nibelungslied." They looked like the two born rulers of men they undoubtedly were, so towering in their height, and so colossal in their proportions! They were like the Alps and the Andes of the human race. And both of them we knew had been great athletes in their youth, and had besides gone through all the hard drill and the severe discipline of German barracks.

The athletic feats which are usually taught in a "Turnhalle" are trapeze, horizontal bars, climbing, clubs &c. You may go there every day, if you like, or three times a week, or even only once a week, according to the terms of your arrangement with the trainers, or you may join a special class at a special hour to undergo some special training. I belonged to a special class of this sort when I was at Leipzig. I used to go there and practise clubs with several others every noon between 12 and 1 o'clock to the sound of an accordion. It is probable, that these German gymnastics are not so efficacious as the English games are. It is certain, they are not half so exciting and exhilarating as tennis, cricket and rowing, and especially rowing. To my mind, there is

no other exercise so refreshing, so exhilarating, so complete, and so thoroughly adapted to all the physical and moral needs of a student who burns the midnight oil and sits for hours in his own rooms as rowing. You must hear an Oxford undergraduate talk about the river, the Torpids and the Eights, the Dark and the Light Blues and of the approaching Regatta on the Thames to be able to form an idea of what I say. Just ten years ago about this time, I was present at a race between the Oxford and the Cambridge Eights, when, as happened also this year just three weeks ago, the Dark Blues, *i.e.*, the Oxford Eight carried the day. I shall never forget the impression left on me by that race. I was the guest of an eminent Orientalist and his wife who took me there, and I have seldom spent a more charming afternoon in all my life. We took our stand on the deck of a steam-launch fitted up for the occasion, and anxiously awaited the arrival of the Dark and the Light Blues. Once these were in sight, there went up bravos and hurrahs, shouts and exclamations varying from the gravest base to the acutest treble, and accompanied by such a simultaneous waving of silk handkerchiefs as could be better seen than described. But what struck me most were the manly, Grecian forms and figures of some of the oarsmen. I had just passed through Paris and the Louvre and so I was in a better mood to appreciate such artistic points than if I had arrived straight from the beer saloons of Leipzig or of Bonn. Some of these Englishmen looked like Apollos and others like Hercules, one of them like an Adonis, while there were those who reminded me, I must say, more of the "Dying Gladiator" than of anything else. For some days, there was no other talk except the inevitable boat-race, and the Dark and the Light Blues—yes, and the Phoenix Park murders too, which had just been perpetrated at Dublin. Undoubtedly, there is nothing comparable to this rowing and other English games, so far as excitement and enjoyment go, but they take up such an awful lot of time, and few real German Students could ever afford *that*. I believe students in Oxford and Cambridge devote all the afternoon hours before dinner to such games and sports, so that it is not surprising if there be German Professors who are of opinion that those English Universities are chiefly intended to train sportsmen and not scholars.

How could a man be a Milo of Cortona and a Cato Major both at the same time ?

As for the Hindu Students they have given up the old system of gymnastics which their forefathers used to go in for, and they have not yet fully taken to the English games. The same state of transition—of halting and hesitating between two boats, marks even the choice of their games and recreation. Like the antique Persians, the ancient Hindus were also taught three useful things :—To draw the bow, to ride, and to speak the truth. Their modern descendants have, however, slightly changed the mode :—

“ Bows have they, generally with two strings ;
Horses they ride without remorse or ruth ;
At speaking truth, they are perhaps less clever,
But draw the long bow better now than ever !”

Don Juan, Canto XVI.

So far, however, is certain, that we are not likely to be of much good in anything, until we have learnt to combine some sort of physical exercise with that hot-house process of education to which we have been all more or less subject from our very infancy. This body of ours may verily be what the good St. Francis d'Assizi chose to call it, *Our Brother Ass*, but as long as we are so nearly related we can get some work out of it, only if we keep our nearest kith and kin in a perfectly normal and efficient condition. It would not carry even our dirty linen if we neglected it altogether.

From the “Turnhalle” or the gymnasium where the German University men develop their muscles to the gymnasium where the German adults undergo a preparatory course of studies for the University, the transition seems natural enough. At least, the names are similar though the functions are somewhat different. This similarity of names is accounted for by the fact, that they are both originally derived from the Greek gymnasium—an institution in ancient Greece where Grecian youths used to receive lessons in Music, Rhetoric, Logic and Philosophy, but above all, in all kinds of athletic sports in which the ancient Greeks are well known to have attained such rare excellence. Their Olympic games were famous all over the ancient world and those who won

the prizes were carried over the shoulders of their fellows and crowned with laurel wreaths. They had to go through these athletic sports more or less *naked*; hence the Greek name *gymnasium*. Hence the Greeks who saw some of our Indian Fakirs when they came to this country with Alexander, called them the *gymnosophists* or the *naked philosophers*. But the difference between the ancient Greek gymnasiums and the Modern German gymnasiums lies in this, that in the latter mental training and cultivation hold an essential and the muscular a subordinate part, which is just the reverse of what it used to be the case in the ancient Greek institutions. This training and culture are, as I have just hinted, a sort of preparatory course for the Universities. Nobody can join any of the four learned Faculties without it. Nobody can enter into any of those learned Professions such as Theology, Law, Medicine and Philosophy (in the widest sense) without previously having undergone a complete gymnasium course. He can be a *student* (a term applied exclusively to the University men) only if he has been a successful *gymnasiast*. An exception is, however, made with regard to foreigners, if these can satisfy the authorities to a certain extent that they have had the advantages of a similar education elsewhere.

The chief objects of a gymnasium course are three: (1) To draw out and develop all the faculties of the mind which is, as you know, the real derivation of the word *education*, (2) To provide a fund of useful and general information and (3) To enable the *gymnasiast* to find out his particular bias, those special aptitudes which should guide him in the choice of a profession and which he would be quite free to follow in his University career. All these objects it tries to accomplish by a curriculum of studies extending over a period of eight years, and embracing all those various disciplines which are so essential to a gentleman and a scholar in after-life. These disciplines are Classics, Ancient and Modern History, Geography, Mathematics, the Physical Sciences and the Modern Languages. Classics, of course, take precedence of the rest. They are the *Literae Humaniores*, and as such should take the first place in a course whose ultimate end is to bring up human beings as perfect and complete as they can be in our present environment. That

the arts and humanities of Greece and Rome have a refining and humanising influence on all those who undergo the necessary training is a proposition which few would venture to deny, though there may be a difference of opinion as to the amount of time and energy that should be devoted to them and as to the manner in which they should be learnt and made use of. In the German gymnasia boys learn not only to read and to translate but also to write and to speak Greek and Latin. They even perform some of the Greek and Latin plays in their originals. On one occasion, the gymnasiasts of Leipzig brought the "Antigone" on the stage, to which they had also asked their friends and relations;—and they did so with great success. At another time they performed the "Agamemnon," and the boy who had the role of the "Iphigénie" scored such an uncommon success, that his guardians for some time seriously thought of making him an actor for the rest of his life. In this case personal advantages were also on his side, for our gymnasiast had the same blue eyes and the blonde curls which are attributed to the beautiful daughter of Agamemnon. Thus the Classics are read, spoken and enjoyed all at the same time. Classics are followed by Ancient and Modern History which is taught from such excellent compendiums as Weber's "Welt-Geschichte" or Universal History, while for the Physical Sciences they use such books as Schröder's "Buch der Natur," one of the best of the kind I have ever come across. But the distinguishing peculiarity of these historical and scientific studies consists in those long excursions which the gymnasiasts under the guidance of their tutors undertake in the months of July, August and September. They cross flood and fell to collect fresh specimens of the flora and fauna which they have read of. They wander from one part of the country to another to observe the different strata and formations in which it is so rich. The Rhine Valley, in particular, is very rich in volcanic formations, and I shall never forget the intense joy I once felt when, wandering about the fields of the Rolandseck near Bonn, I suddenly found myself in the deep caverns of what must once have been a crater—so perfect was the shape of the huge cauldron, and so numerous were the lava-stones black, red and yellow, that were lying about the place. I collected as many of those stones as I could and came back to

Bonn thinking of "the light of other days" that must once have burned there.

Here is a piece of *agate* which I once brought from my expedition into the Brohlthal and Altenbar. With regard to the historical studies, the gymnasiasts utilise this long vacation to visit some of those very spots where the events actually took place, besides inspecting arms and weapons, coins and manuscripts, preserved in the museums of the different towns. This not only corrects and corroborates the information gathered from books, but makes the study of history very attractive and the pictures of by-gone days very fresh, vivid and life-like. This is infinitely better than the system pursued in India where boys "mug up" a chaotic mass of details without life and animation, coherence and connection to bind and light up the whole. Geography comes next and is regarded as a subordinate branch of History which cannot be properly grasped without it. In Mathematics, the Gymnasiasts I believe, have to go through all Arithmetic, all Algebra, and all Geometry, and some portions of Statics, Dynamics, as well as of Trigonometry. Of the modern languages, they have to learn both English and French, although half so much stress is not laid on them in a gymnasium as in the *Real Schulen* (Real Schools), which are especially intended for those who do not pursue a scholastic career but become merchants, accountants, correspondents, commercial travellers *et hoc genus omne* of the world of practical men. From what I have hitherto said, you must have perceived that though a German Gymnasium answers, no doubt, to our Indian schools, yet it is altogether far superior to the latter, inasmuch as it enjoins a far more systematic training, inculcates a far more comprehensive course, and extends over a much longer duration. This gymnasium course is the solid basis on which the later University superstructure is raised, and so a short account of it was necessary to give you a complete idea of the University life in Germany.

I hope I have now given you a fairly good account of High Education in Germany and of the German University life, enlivened by touches of my own personal reminiscences. I have not been able to deal with it in as systematic a way as I should have done if I had had the necessary books of reference at my disposal.

My own library is not in Hyderabad, and I have not been able to procure those books of reference from anybody else in Chuddergaut. I had consequently to depend entirely on my memory for such facts and figures and statements as I have made, and I hope, you will receive them with the necessary indulgence. It is partly also for this reason, that I have dilated more on personal adventures and reminiscences than I should have otherwise done. But I hope those reminiscences have interested you, and have somewhat relieved the dull monotony of what might be called a learned discourse. Allow me now to finish this lecture by making a few observations about intellectual education in its relation to moral and spiritual culture. I believe you will all agree that if education be "the harmonious and equable development of all the powers," then in a complete course of education, due proportion must always be given to the culture and growth of those intuitions which form the basis of our moral and spiritual nature. It is these intuitions which make Man the wonderful piece of work that he is: the paragon of animals and the crown of creation. Stunt or stifle them in him, and you deprive him of his supreme prerogative, and his divine birth-right. These are not mere phrases but very sober truths which have been accepted by all true philosophers from Plato to Kant. I do not doubt or deny that the training of our intellect has a certain correlative effect on the growth of our moral and spiritual faculties just as the strengthening of our lungs has a similar effect on our stomach or the kidneys. But to say, that the best way to train our conscience is to study Logic or Mathematics is about as reasonable as to affirm that the most effective way to supply food to the stomach is to breathe as much fresh air as you can. No; our moral and spiritual intuitions are quite distinct from our senses and the understanding, and we must give them their due nourishment, if we wish to preserve them in health and vigour. Otherwise, like our other senses and organs, they get stunted by neglect and atrophied by disuse.

When such an atrophy has taken place, the man becomes a beast or a demon, or far worse. That intellectual education divorced from moral and spiritual culture leads to this result is very well illustrated by the story of Doctor Faust, which has been

dramatised by Goethe, and rendered into such beautiful music by Gounod.

At the end of the 16th century, Christopher Marlowe also wrote a drama on it which bears all the marks of his powerful but eccentric genius. The story of Faust is based partly on fiction, and partly on truth which is often stranger than fiction. There lived in the beginning of the 16th century a certain Doctor Johannes Faust, who was a townsman and contemporary of Melancthon's and who, after having studied at Wittenberg and other places, ultimately gave himself up to magic, and as the popular traditions said, also to the Devil. He has studied Philosophy, Medicine, Jurisprudence, and alas! Theology, and he has found out that he knows very little of what he really cares to know! He is called a Doctor, a Professor, a Magister, but he feels that he is a greater fool than ever! He fears neither Devil nor Hell, but alas, scepticism has dried up the very fountain of all his religious emotions! There is nothing in common between him and the average ordinary humanity: "He cannot feel for others' woes and dare not dream his own!" "Es möchte kein Hund mehr so leben!" (No dog would care to live any longer like that!) He has sacrificed all the pleasures and pastimes of youth only for the sake of knowledge, but he has discovered that all his boasted knowledge is but delusion, or at best second-hand patch-work! He has hazarded his all on that *one* cast of the die, and he has drawn a blank! This drives him well nigh mad and he gives himself up to magic and theosophy.

" In hope, through spirit—voice, and right,
 Secrets now veiled to bring to light!
 The vital powers: the embryo seeds survey,
 And fling the trade in empty words away!"

* * * * *

In this frame of mind he is sitting one evening in his narrow but high—vaulted Gothic chamber, surrounded by skulls and skeletons, mystical books and chemical instruments, the full-orbed moon shedding a dim religious light into his cell through the painted window, resolved either to gain higher knowledge, or to put an end to his miserable existence. At last his intense will makes the Earth-Spirit appear, but oh! he

can not even bear that awful sight! He is ready to quaff the fatal potion, he even puts the crystal goblet to his lips. But the gloomy night has dawned on a bright morning—and the sweet silvery chimes of the Easter bells announce to him and to an afflicted world the joyous tidings of the Resurrection! Reviving Nature joins with the redeemed Man to testify that the Spirit is stronger than the flesh, and that we can out of the ashes of our own dead selves, rise to higher and more beautiful things! Early associations throng on him and the sweet celestial strains dispel his fears. He now goes out for a walk, accompanied by his *Famulus*, but his dark thoughts do not leave him and he returns to his cell no better than he was when he left it. He has, however, been followed by a black poodle which soon develops into Mephistophles or the Devil, who

“ Under fair pretence of friendly words
And well-placed words of glozing courtesy
Baited with reasons not unplaussible,”

tries to ingratiate himself as the Devil always does. Faust asks him who and what he is, to which the Devil replies that he is a part of that negative and destructive principle which is co-existent and co-eternal with the other principle, and that he would be most willing to provide the Doctor with all the riches and pleasures of this world provided the Doctor's soul be his in the next. In the state of utter agony and despair that he is, Faust accepts the terms and barter his soul away for the whirling joys of sense. Alas! he had not the courage of *Siddhartha Sakyasimha* or of Him whose day of Resurrection it was, to say to the Evil One, “Get thee hence, Satan.” Accompanied by his Mentor, Faust now leaves his dark, dingy rooms behind and sallies forth into the wide, wide world of which he knows so precious little; and the first place they go to is Auerbach's Keller, a famous underground wine-cellar in Leipzig near the University. In this cellar, the Doctor, for the first time in his life, sees on what cheap terms average men can be supremely happy who have studied neither philosophy nor theology. He gets out of this cellar on a rolling wine-barrel! Mephistophles has then a strange recipe prepared for him in the Witches' Kitchen, and this *elixir juventatis* gives back the Doctor his youth, who though only thirty years old, had prematurely aged

by a life of hard study and severe abstinence. Again, he goes out *on the spree* and meets a pretty young girl, called Margaret or Gretchen going to church to confess, and he is at once smitten with her charms. The scenes which describe Faust's wooing and winning of Gretchen are perhaps the most charming of all in Goethe's drama, particularly the one where she asks him if he believes in God, and his famous reply :

“ Call it Bliss ! Heart ! Love ! God !

I have no name for it !

'Tis feeling all ;

Name is but sound and smoke

Shrouding the glow of Heaven !’

But, alas ! Gretchen is seduced and abandoned. Her brother Valentine gets scent of it, challenges the ravisher and is killed in a duel by Faust with the Devil to back him, of course. Faust now takes to his heels to avoid the ignominy of a criminal arrest.

Restless he wanders from one country to another “reeling from craving to enjoyment and in enjoyment languishing from desire” and sucking the very depths of sensual gratification. When after some time he returns to his native land and is dancing with a young witch in midsummer night on the Brocken in the Harz Mountains, he perceives the shadow of a young maiden, pale and fair, with shackled feet and a crimson line round her neck, trudging along at a short distance, and he knows it at once to be the spirit shadow or the *double* of his Gretchen. Poor Gretchen has in the meantime passed through all the stages of shame and misery, been thrown into prison, and is now about to be hanged for murder ! Faust curses Mephisto for having kept him so long in the dark about all this, and bids the Devil take him that very instant to Gretchen's prison-cell, if perchance he may yet save her ! He succeeds in getting into her cell but finds her raving mad. She hardly even recognises him though she still remembers their first meeting in the garden. All his efforts and entreaties to get her away prove futile. He would stay with her and share her fate but the Devil persuades him otherwise and hurries him away.

“Ach! wäre ich nie geboren!”

“Oh! that I had never been born!”

exclaims Faust and disappears. This is a veritable turning-point in Faust's spiritual life. His slumbering conscience is roused and he is penitent. He sees the misery and sorrow he has wrought by his selfish and sensual life, and he makes up his mind to turn a new leaf. He resolves once more to be loyal to those divine intuitions of Truth, Justice and Love, which in league with the Devil he has so ruthlessly kicked at. But above all he is determined to atone for the past by

“Deeds of daring rectitude, in scorn

For miserable aims that end in self.”

For the rest of his days Faust takes to the gospel of genuine, unselfish work, and actually reclaims for mankind and civilisation a large tract of waste and submerged lands. Mephistophles is still with him, but his power over his victim has been getting less and less ever since Faust has taken to noble work, and to living for others. So that when at last the hour arrives, “the clock stands still and the index falls,” Mephistophles makes, no doubt, an attempt to seize his prey but is foiled. For the celestial angels, bearing Faust's immortal soul, interfere, but above all, the purified and perfected spirit of that poor girl whom he had once so greatly wronged, his Gretchen! The choir of angels sings:—

“Gerettet ist das edle Glied
Der Geisterwelt vom Bösen:
*Wer immer strebend sich bemüht
Den können wir erlösen;*
Und hat in ihm die Liebe gar
Von oben Theil genommen
Begegnet ihm die selige Schaar
Mit herzlichem Willkommen!”

(Goethes' Faust II.)

Saved is this noble soul from all,
Our spirit peer. *Who ever
Strives forward with unswerving will
Him can we aye deliver;*
And if with him celestial love
Hath taken part,—to meet him

Come down the angels from above ;
 With cordial hail they greet him ;

Miss Swanwick's " Faust."

And as the highest incarnation of the divine, celestial love
 is the pure self-sacrificing love of a noble woman, so it is

" Das Ewig-Weibliche
 Das zieht uns voran !"

That is to say, it is:—

" The Ever-Womanly
 That draws us on high."



A PLEA FOR

EDUCATION



BY

J. MANGIAH, B.A., L.T.,

*Author of "Gleanings of a Rambler," "Indian National Odes
with Apology of Poesy," "To Gurukul," etc.*



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INTRODUCTION.

The limitations laid down by the nature of the subject as of its public govern the form of this poem, which has love and duty as watchwords.

RAICHUR,

5th December, 1911.

J. MANGIAH.

DEDICATION

TO

THE GIVER OF ALL LIGHT AND HAPPINESS.

In what terms can we dedicate,
Or endless charms Thine vindicate
To man at subtleties agape
As time thy measuring tape?

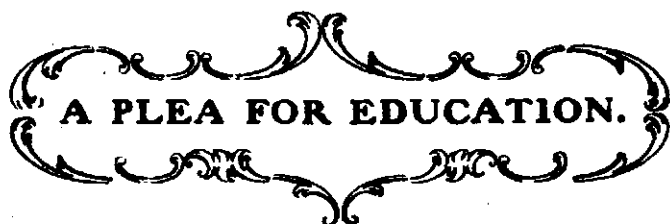
Father, to Thee be all applause,
Because Thou art our primal cause ;
Thou art reality,
May we e'er think of Thee.

Father, Thou art our blessed light,
Thou art our guide to paths of right
May we but follow Thee
In love and verity.

Thou art our time-bound world above,
Whom we can reach but through our love,
Thy splendour vast Divine,
In meditation Thine.

We pray Thee that Thou grant relief,
That we may be of right belief,
That we may sing Thy praise,
Thy Universe to raise ;

That all may be one happiness
Of love and knowledge Thee to bless,
One joy, one love, one thought,
Supreme and blissful lot.



A PLEA FOR EDUCATION.

Goddess pure of learning great !
Inspire to sing thy praises vast,
To sons of India,
That they may read in love.

If other nations of the world
May find in this a charming word,
It is thy sweetest grace,
Their good humanity.

If I do better than I hope,
This work of love, necessity,
May thou be praised the more,
May man be blessed the more.

Good God doth rain his gifts on all ;
What blessings in our light and air !
E'en such is knowledge dear,
What charm in that sweet grace !

Here is the highest grace Divine,
Dearer the more we know of it.
Is ignorance a bliss,
That animals do live ?

Knowledge the light of intellect !
 Knowledge the air which wise men breathe!
 Goddess ! to thee we bow,
 That we may have more grace.

When natural change of conditions
 You from your old selves partitions,
 You must live well informed,
 Else you will be deformed.

When even your Philippines
 Informed live on much better lines,
 In twelve American years,
 In benign hundreds dears ?

Or do you choose to be asleep,
 And to your old serenity keep,
 Where dexterous landlord good,
 And heartless lender stood ?

If you cannot yourselves adjust,
 In nature's realms, is it not just,
 That you must suffer or die,
 While human remedies sigh ?

An ancient land of Aryans wise
 But slowly all situations tries,
 In her philosophic mood,
 But where she ever stood ;

Though now and then a warning comes,
 Which friendly observation sums,
 Or filial duty cries,
 Before it feeling dies.

But nature lashes, puts to sword,
 If she finds you can't heed her word ;
 If her trumpet sound,
 In your sleep is drowned.

But lend a thought on how do climes,
 In these advanced and clamorous times ;
 Unless you learn and act,
 You must rue as a fact.

When materialism rules the day,
 You must not tarry in the fray,
 But gird you up and run,
 For 'tis no longer fun.

You are the lowest in the scale
 Of climes in civilisation's pale :
 Look you at even Spain,
 Or Russia to your pain.

A general education seek,
 For all, in your devotion meek,
 Though of an humble kind,
 That it may brace your mind.

You can read praises of your God,
 Or to a great man's story nod,
 For your enlightenment,
 Whate'er your sacred bent.

Suppose you did not know to walk,
 Or yet you did not learn to talk,
 Would you have been so free
 As you at present be ?

Prize learning at your walking's rate,
 Or talking in a poor beast's fate,
 As sure you understand
 For you their great demand.

I daresay if you had not known
 To talk or walk, you would sure frown,
 When I say you must know
 To talk or learn, all so.

Pleasures of lore can we recount ?
 Of knowledge 'tis an endless fount,
 With mate experience,
 It leads to highest sense.

Learning records experience,
 Traces the paths of thought immense,
 It leads you by the hand,
 To thy pleasantest strand.

As tillers you can till so well,
 With plenty that your land may swell ;
 With methods right, each field
 You will its fullest yield.

On thy India's-grassy wold,
 Education's grace untold,
 In red and pink and yellow ;
 How well your souls do mellow !

Dewdrops of education dear,
 On your flowering plants, so clear,
 The world you beautify,
 God's work you glorify.

Each your soul a tender plant
 Of growth and hope exuberant,
 Which want of light may stint,
 But early take the hint.

Is it not shame to God-made man
 In ignorance to live his span,
 While wondrous forms unfold
 Abroad in charms untold,

For very thought of knowledge great,
 Equipment worse than in your fate ;
 Say you that Government
 Those benefits them lent ?

Your worthy Government benign,
 To make you all like them doth pine ;
 'Tis highest charity
 To make thy man like thee.

For in thy weal it sees its strength,
 And in thy strength its weal at length ;
 Henceforth identity
 Of interest so free.

While you the plants do flower and smile
 Is garden's beauty, name, and style ;
 This is good gardener's pride,
 On your Government's side.

The wishes in your mind that shoot,
 Will yield your gardener good fruit ;
 Thy wishes are his crop,
 To him an ideal prop.

As you mid nations higher rise
 In education, and grow wise,
 The Government so wise,
 With you likewise doth rise.

If reigns thick ignorance and feud,
 And desolation's hatred rude,
 What are you worth for them,
 Would they not you contemn?

If educated, you would see
 With open eyes as men so free;
 In love you would be lords,
 This happiness affords.

At least to read and write and count
 Is not an acquisition's mount,
 Your minds to be so fallow,
 For them to be so shallow.

To read your religion or law,
 Or moral from a position draw,
 You need good learning's aid,
 Of which you seem afraid.

Learning the sunshine of the morn,
 Learning the choicest brother sworn,
 Learning the eyesight true,
 Which wise men knew.

If you a general grounding have,
 In arts and sciences, that will pave
 Your way to do aught best,
 If you can only test.

Begin with simple mother tongue ;
 With some books read and some songs sung,
 Straight take to English speech,
 World's latest thoughts to reach.

The genius of language sweet,
 Elastic, comprehensive, meet,
 Your minds so well doth brace,
 And arm with worldly grace.

With English, lingua franca grand,
 Sciences and arts command,
 Whatever is new in times,
 In howe'er far off climes.

The influence of English tongue,
 In all world's quarters so well rung,
 Acquire for Sanskrit's aid,
 And Hindi's her handmaid.

Your Sanskrit is high native tongue,
 In which your genius has sung
 Its strange delights,
 And its mysterious lights.

In your own selves you were so lost,
 Or so by ignorance were tosst,
 The rich could not yet see,
 The humble peasantry.

Now peasant and prince began to see,
 That all must educated be ;
 To it good Government,
 A serious thought has lent.

Now haste ye all to one great end,
 As good God doth in love intend,
 That ye both God and man
 May bless with warmth ye can.

A poet's work is but to please,
 But not with severe facts to tease ;
 Though he in streets must sing,
 Yet can he sing nothing ?

So now and then in poet's form,
 Which had for you so long a charm,
 Do I sing but to please
 And nobleness increase.

When little ones in beauty clad,
 Do sport in fields of mirth so mad,
 Should we not find a vent,
 In intellectual bent,

For energies that lie pent up,
 In useful pursuits that would prop
 In times of want, and train
 Heads and hands in the main ?

Childhood's peculiar gayest charm,
 A pliable energy's form,
 Greatest comprehension,
 So free from reprehension.

It has strong imitation's aid,
 Most natural are forms here made,
 When habits are best formed,
 The hearts most gaily warmed.

Exuberance of energy,
 Endless in form, and e'er so free,
 So easy and so light,
 Blithe spirits ever bright.

With healthy emulation's aid,
 Foundations in your trust are laid,
 For that grand edifice
 World-wide and high as heavens.

Unbounded love on mother's lap,
 Perennial fount of all life's sap,
 Unquestioning trust and ease,
 Unthinking wordless peace.

Your festive homes with twilight fires
 And Vedic hymns, your heart admires,
 Are love in pleasantness,
 Perpetual daintiness.

The rudiments thus early taught,
 Are built upon to work your lot,
 The thought resultant staid,
 When your life's debt is paid.

Each moment works to this great end,
 That you máy always build or mend,
 Though some you hardly know,
 Unskilled in seeing so.

While suckled at the mother's breast,
 Or rocked in cradle's sweetest rest,
 Fondled on papa's knees,
 On scrambling amid trees,

You have your education sweet ;
 Lessons in varied forms do greet
 Your willing minds all through ;
 In books is there some clue.

Nor should you think that all you read
 Is real experience you need,
 For your great work of life
 With contraries at strife.

The world is your true grandest school,
 Where God best teaches you the rule,
 With experience endight
 That you may see the right.

In love of forms and processes,
 Observe in inmost recesses
 Of nature, analyse
 Each charm, and summarise.

Your time and means economize,
 The facts of life systematize ;
 But first you generalize,
 Then wisely specialize.

In steady habit, concentrate
 On highest things and become great ;
 E'er living noble wise,
 Well make your mark and rise.

With health and vigour your birthright,
 And pleasantness of religion right,
 With trust in God above,
 Move on with boundless love.

On religion's heights, with simple hearts,
 Bravely play ye in life your parts
 So rich with stores of love,
 For guide with God above.

Abstrusest flights of reasoning,
 Occasional mental seasoning,
 From childhood you were taught,
 For you, were wisely sought.

In want of freedom are you free,
 If you would really great men be ;
 After thy principle prime,
 Unswearing act all time.

Drop down thy abyss, never rise,
 Efface thyself, which slowly dies,
 Ne'er deviate in thought,
 This is a blessed lot.

On thy intuition depend,
 You will on each occasion mend,
 But never raise your head,
 Be e'er completely dead.

Fickleness is loss of power,
 It is a restless weakling's dower,
 Be fixed therefore in weal,
 In bliss thy future seal.

We poets are a solicitous race,
 Who gracefully the streets do pace,
 Occasions come but few,
 When we can be heard too.

Since bustling Science held our torch,
 We chose to stay but at the porch ;
 When Science learnt its spells,
 We took to caps and bells.

Yet consolations have we all,
 Far higher than at world's men's call,
 That they would us admire,
 And to be we aspire.

Our honoured trade no profession,
 For people us as beggars shun,
 Yet must we interest,
 Our ignorance, our pest.

Knowledge e'er love for its own sake,
 For would you all day-labourers make,
 And so through life remain,
 And risk all higher full fain ?

Or inheritors of blissful realms,
 Where endless knowledge ever helms,
 Eternal splendour blooms,
 Life's highest success booms ?

What can refuse the eternal need
 To man, on which do ever feed
 The aspirations high
 Of human heart ; where lie,

Imbedded, possibilities
 Strangest and highest ; how can cease
 The endless joy and bliss
 Of promise vast and peace,

Of man's highest all powerful lot,
 Held out in knowledge ever sought,
 And action in its wake
 For God's own blessed sake ?

This noble lot your birthright true,
 Which if you would secure could you,
 Yet baser motives thrall
 Your minds, proofs of a fall.

Can Poverty you these refuse,
 A truest friend of worthiest Muse,
 Of greatness real all time,
 Unless you make it chime

With baser motives void of zeal
 For things of lasting health and weal,
 Contented in their mood
 For ignoble search for food ?

Money has power with the fool,
 Poverty is a wise man's school ;
 Your wealth has charms immense,
 Of world's chromatic lens.

Our English is of charm immense,
 And of a world-wide influence ;
 And God in this ordains
 Be sung these loving strains ;

For Indians who would realize
 That English is their own, and prize
 Its mind-awakening,
 Mind's-chambers-opening.

Its general culture and methods
 Of teaching, which the world applauds,
 Are one decided gain,
 Which you must e'er retain :

Be not so used to mental ease
 That least exertion would you tease ;
 In application staid,
 Be not of work afraid.

Yet ne'er a gain without a loss,
 Merits each system do emboss,
 Your methods train 'mid pain,
 In these you run full fain.

By training in hard things is grown
 The will to do what ought to be done ;
 This brings you up for duty stern,
 Which you ought first to learn.

In giddy toys with front to skies
 To severities are closed whose eyes,
 Waywardness rules, a flaw,
 In place of heavenly law.

Let not the school be house of play,
 Where it is said of you to-day,
 There is less moral strength,
 A serious charge at length.

Your growing interest and joy
 In lessons of school you safe convoy,
 Will make you glorious, sweet,
 So free and glad, discreet.

A combination is the best,
 Scientific sense is e'er the test ;
 As to what should be first,
 Your teacher must adjust.

When your mother for your good,
 Gives you against your will your food,
 Is that a violence,
 Or force in any sense ?

So when your elders compel you,
 Or Government a mother true,
 To read at school and thrive,
 Obedience contrive.

Go all good children to your school,
 So gay like fishes of the pool,
 Dressed like cherubs bright,
 With godly charms endight

The school-house is a substitute,
 That best the general mass would suit
 Of revered India,
 In place of Gurukula.*

Your revered teachers taught each lad,
 Though all their Veda together had ;
 Completeness was their point,
 All knowledge in full joint.

Pupils they kept and taught at home,
 And helped through facts of life to become
 Through choice and plan of each,
 The highest good to reach.

* Gurukula means the home of the teacher.

For teachers, persons seek of love,
 Not those whom other professions drove,
 Masters contended, great,
 Even-minded and sedate.

Worship them, souls of deliverance,
 With all that's noble in reverence,
 For they will sow a seed,
 To bear fruit with thy meed.

Worshipful mind the secret tie,
 That links you higher than you try,
 With fruits of wondrous gift,
 This is a secret drift.

In love, he will sink where you are,
 And go yet further back by far,
 To see your frailty's form,
 And its good remedy's charm.

Your teacher directs light and rain,
 Turns each circumstance to your gain,
 By force of powerful love,
 That you may e'er improve.

He will your petals blow so nice,
 That your small bud may in a trice,
 The world amuse in bloom,
 In colour and perfume.

The sepals of colour and number grow,
 In natural order, as doth blow
 Your bud of knowledge sweet,
 But as it is so meet.

The lovely lawn of mind to prim,
 Or lay with saplings out so trim,
 He has a wondrous skill,
 As of a powerful will.

The walks and by-walks well laid out,
 Around your each perennial spout,
 Do make each garden look,
 A paradise each nook.

The person gaunt with furrowed mien,
 The ill-paid probationer of spleen,
 Must you now metamorphose,
 To your life-blood's repose.

Make him a lord that can e'er smile,
 In grace unbounded on the style
 Of you and world around,
 With creatures his abound.

The hero of a fondest might,
 Grave poverty and ills doth fight ;
 The noblest profession,
 As sorriest trade you shun.

With moral courage right his cause
 He works ; to think he does not pause,
 With wisdom practical,
 With insight so real.

Example noble of teacher wise,
 Should start you on your enterprise,
 In principle so grand,
 Which you must well command.

Of justice, say, acquire high sense
 And practice, public confidence
 Will be your worthy lot,
 And rectitude is got.

Commercial rectitude is wealth.
 Unequaled by all stores of stealth ;
 Learn this from Western trades,
 For they stood cannonades.

With this and union of trades,
 The tree of commerce never fades,
 But yields you endless fruit,
 Through every fresh-born shoot.

You can have labour organized,
 Your labour skilled and specialized,
 Your factories mobile,
 E'er free from change, docile.

Industry, commerce economics,
 Are natural steps in historic
 Of our earth's nations' health,
 And of their substance wealth.

All praise to peaceful stability,
 To tradition tenacity,
 Which you have e'er displayed,
 High laws you e'er obeyed.

The lightning speed of feverish haste,
 In pushing progress on is waste,
 For when you must look back,
 You must regret and rack.

The defects warrant radical change,
 Your whole machinery derange,
 Undo the hasty past,
 Mid loss and regret vast.

Yet nature never takes a leap,
 And you must be a lifeless heap
 Of fear, despair, and doubt,
 Mid what you see in rout

So slowly develop and sure,
 Wisely assimilate ; be pure,
 That you may worthy be
 Of rank so high and free.

Thus principles learn and rectitude,
 Strong habits, and beatitude ;
 Be pure and wise and good,
 With heavenly solicitude.

Should service fail enough to bless,
 Or not at all in times of stress,
 Your learned selves must bend,
 To handicrafts descend.

In them you may find good delight,
 Exercise for your limbs so light,
 Gain good acquisition,
 Of life a pleasant run.

Technical arts will help you true
 Your worldly work so well to do,
 But cast a glance westward,
 They deplore march downward.

And forget not your religious bond,
 All powerful and all these beyond,
 Which can create you worlds,
 But scan its spiritual folds.

Your Yoga is your missing link,
 Which you must now put in and think,
 Your life would be serene,
 As your grandsires' had been.

Skilled in your national sports and arts,
 Adharwa winging your proud darts,
 Archers and warriors brave,
 Your gleeful banner wave.

Military training is a need,
 It teaches promptness, sows the seed
 For higher discipline,
 And order most serene.

A spiritual nation you beware,
 Great truths have dawned on you, to fare
 Not soldiers in the field
 All day with buckle and shield.

Hence division of function, caste,
 According with one's fitness, cast,
 Without a parallel,
 For weal of hive and cell.

Let intellect guide and strong arm rule,
 Thrift keep the purse and work each tool
 In lovely harmony,
 For peace all through and glee.

You have a higher interest,
 Than earthly things can bring, your zest
 Of abstractions is test,
 That you are livers in rest.

A meditation and a calm
 In inner facts of life, the balm
 Of your spiritual life,
 A peace in endless strife.

Mid fearful contraries, the gist
 Of life of ancients yours, enlist
 World's admiration great
 Of your unrivalled fate.

Life's hard realities in face
 Were looked with boldest grace,
 In smile was summed up strife
 Of their most peaceful life.

The grasp of truth the special charm,
 And sweep with which you transcend form
 In blissful thought enwrap,
 Abstraction's heights cloud-capped.

Such is the seed which they had sown,
 In your philosophies full blown,
 But reach these ancient heights,
 Through lingering paths and lights.

Found resident academies,
 Or Gurukula Universities,
 Where sage Acharyas teach,
 And ancient heights you reach.

With clustering Gurukulas around,
 Colleges for special arts so sound,
 Reach heights so practical,
 Mid sage Acharyas all.

Your ancient sciences so grand,
 Your rapt attention do demand,
 As links in but one chain,
 One with your revered grain.

Hindu, Musalman brothers be,
 Through religions but one God see,
 Same mental processes
 Through various means to bless.

The means do sink to nothingness ;
 Belief though varied must confess
 The truth of inner soul,
 Which is the common goal.

Difference in condition a slave
 Which birth and circumstance you gave,
 Look higher to facts, so wise,
 Experience improvise.

Parsi, Buddhist, all but one,
 Same laws govern each God's good son ;
 Difference in comprehension,
 But due to condition.

Each religion a different stage
 Of one truth, and each seer and sage,
 A traveller to the goal,
 Reflecting clear his soul.

A different understanding breeds,
 These slightly differing minor creeds ;
 In vindication's light,
 They are truth's phases right.

A universal religion,
 Of central truth and union,
 Will make you progressive,
 And ever submissive.

The bane of petty prejudice
 Will vanish, and will reign full peace ;
 True greatness to your eyes
 Will open as you rise.

Comparisons will healthy be,
 And human mind of canker free,
 Of religious hate,
 And purblindness its mate.

In one true universal creed,
 Man's highest aspirations feed ;
 United all in peace,
 Gain your salvation's bliss.

The highest possibilities,
 In view of trivialities,
 That may be now to hand,
 Do not give up and stand.

In India a continent,
 An Empire favoured and content,
 Hundreds of millions,
 Of many religions,

Good law abiding citizens,
 In thirst for knowledge high, immense,
 Of divers professions,
 And various conditions ;

Full many universities,
 To suit their loved activities,
 As cells in one bee-hive,
 Instead o' the present five,

Can have their land to glorify
 In all that's great, and qualify
 Themselves in every field,
 To few that they may yield.

In painting any ideal
 To dip the brush is venial,
 What I have done you know,
 I did but outlooks show.

Just at this time King George the good,
 With high and real solicitude,
 The reigns of Government
 To wield, by God is sent.

A special man of sympathy,
 A king with high-set heart is he,
 Now is the crowning point,
 Oh ! George loved king anoint.

Victoria gave your charter grand,
 Like sons her love you did command,
 George a victorian king,
 Aloud his praises sing.

Our George will outvictoria
 The lovèd Queen in mania
 For your great nation's weal,
 That you may happiest feel.

A world peace-maker's worthy son,
 Had at the very start aught done
 To ensure veneration,
 To secure world-federation.

The brightest jewel in his crown
 Our dearest lovèd George will own;
 The pride and care are his,
 He nobly caresses.

Yet another propitious power,
 Also our kindest nature's dower,
 Has Hardinge brought to us,
 A time so auspicious.

Like stars on gay autumnal skies,
 Where purity with splendour vies,
 Absorbed in highest laws
 Of universal cause.

All members of a family,
 With love the central law of glee,
 That draws our George and Queen
 To us, mid Delhi's scene,

Like birds of glittering plumages
 Of paradise, in vestiges
 Of ancient greatness joint,
 The Royal pair anoint.

**EXTRACTS FROM LETTERS, Etc.,
REGARDING THE ORIGINAL
ENGLISH POETICAL WORKS OF
J. MANGIAH.**

Mr. W. M. ROSSETTI.

.....Allow me to thank you very sincerely for your kind attention in sending the poems. I looked at them, and found a great deal of high-minded sentiment and honourable tone of feeling

Mr. ALFRED AUSTIN, Poet Laureate of King Edward VII.

.....His knowledge and use of the English tongue, in which he has already made marked and most creditable progress.....

Mr. J. J. COTTON, I.C.S.

.....I certainly think they are praiseworthy.....

Mr. HANSRAJ, Principal, D. A. V. College, Lahore.

.....They are a very pleasant reading and show your mastery of the English language.

**Mr. T. RAMAKRISHNA, B.A., F.M.U., Author of "Padmini,"
"Life in an Indian Village," "Tales of Ind," etc.**

.....The book is very interesting.....I must honestly admit that there is a cadence and music in your lines that are very noteworthy, and I have no doubt that as you go on perfecting your literary taste you will give to us something worthy of our country and literature and of the providential connection between England and India.....

Mr. K. VERMA, Ex-President, Arya Samaj, Calcutta.

.....It gives me such pleasure to say that I have gone carefully and critically through your poetical compositions entitled "Gleanings of a Rambler."

I can safely certify without the least fear of contradiction that you have done a real boon to the enlightened and reading world. Some of the poems consist of very deep and high flights of thought, while others are natural, simple and charming. Elegance characterizes the style of the book throughout and the reader never feels giddy. It is truly said that poetry portrays realities of the inner life of man.

V. VENKATARAYA SASTRIAR, B.A., Professor of Philosophy and Mental Science, Maharajah's College, Vizianagram.

.....I have read with great pleasure your 'Gleanings' and the 'Odes' in manuscript. Your powers of versification in English are really extraordinary. The language and the sentiment harmonize with each other so well.....

Mr. GEORGE PITTENDRIGH, M.A., Professor of English, Christian College, Madras.

.....I do see a certain measure of power, more than in most young writers of English poetry in this land.....

K. RAMANUJACHARIAR, M.A., B.L., F.M.U., Principal, Maharajah's College, Vizianagram.

... ..Let me thank you for the copy of "Gleanings of a Rambler" which you kindly sent me. Some of the poems are very pretty and show that the Rambler has true poetic vein and is no mean artist.....

P. T. SRINIVASA IYENGAR AVERGAL, M.A., L.T., F.M.U.,
Principal, Mrs. A. V. N. College, Vizagapatam.

5th February, 1906.

I have read with great pleasure the "Gleanings of a Rambler." It displays great poetic talent. I should certainly advise the author to take pains to develop it, so that the Indian genius might also breathe in the English muse.

(Signed) P. T. SRINIVASA IYENGAR.

Mr. T. RAMAKRISHNA, B.A., F.M.U., Author of "Padmini," Etc.

.....
I have read your poem "To Gurukul," and allow me to congratulate you on your achievement. The metre is faultless. I hope you will persevere in your work and go on perfecting your literary taste. Wishing you all success in your work as educator of young minds.....

"THE INDIAN PATRIOT"

.....
A mind that feels, a pen that writes,
A head that thinks out high and pure,
These produced "To Gurukul" sure.
It opes, indeed, to human sights,
A picture ancient, simple, strong, .

.....
.....
It speaks of Man, it speaks of God,
It speaks of love and faith and peace
And work and simple life and ease,
All India rise, observe, applaud.



SOME LETTERS.

**HER ROYAL HIGHNESS THE PRINCESS OF WALES,
MARLBOROUGH HOUSE, PALL MALL, S. W.,
4th October, 1906.**

DEAR SIR,

I am desired by Her Royal Highness The Princess of Wales to write and thank you for your Indian National Odes, which you have sent for the acceptance of the Princess, together with a letter, the contents of which I have also to thank you for. Expressing to you the appreciation of Her Royal Highness for the kind words accompanying the gift.

I am, dear Sir, faithfully yours,
(Signed) A. NELSON HOOD,
Private Secretary to H. R. H. the Princess of Wales.

**HIS EXCELLENCY LORD MINTO, The Governor-
General and Viceroy of India.**

D/o No. 2301. VICEREGAL LODGE, SIMLA,
15th September, 1906.

DEAR SIR,

I am desired by His Excellency to acknowledge the receipt of your letter of the 9th September and the volume of poems with many thanks.

Yours faithfully,
(Signed) F. L. ADAM, LIEUT.-COL.,
Military Secretary to the Viceroy

**HIS EXCELLENCY LORD MINTO, The Viceroy and
Governor-General of India.**

VICEREGAL LODGE, SIMLA,

14th September, 1906.

DEAR SIR,

I am directed by the Viceroy to convey His Excellency's thanks for your kindness in sending him a copy of your "Indian National Odes."

I am, truly yours,

(Signed) J. R. DUNLOP SMITH.

W. M. ROSSETTI.

LONDON, 3, ST. EDMUND'S TERRACE,

REGENT'S PART, N. W.,

10th July, 1907.

DEAR SIR,

Your book of "Indian National Odes" has been lying by me, along with your very complimentary letter, an unconscionable length of time. I am busy with various matters of writing and reading, etc., and have only now read your volume through. I find the purpose and spirit of it highly interesting, and there are many energetic telling turns of expression. The poems upon themes of Indian religion, etc., would impress me more if I had a little more acquaintance with the subject. I must confess that my ignorance, like that of most Englishmen, is beyond what it ought to be. The two

poems which I like best are "To Motherland" and "To Japan".....

..... Japan, as you truly see, has shown that Asiatics are not always to be trifled with. Russia has found it out to her cost, and all Europe, and America too, have been pondering the lesson in a rather gloomy spirit.

Wishing well to you and your country.

I am, very truly yours,

(Signed) WM. M. ROSSETTI.

SIR WILLIAM WEDDERBURN, Member of Parliament.

TELEYRAMETIC STATION—BARBER'S BRIDGE,
MEREDITH, GLOUCESTER,

4th October, 1906.

DEAR SIR,

I thank you for kindly sending me your "Indian National Odes," which prove your devotion to mother India, and at the same time show friendly sympathy with all branches of the human race.

Please also accept my thanks for your appreciation of the work I have tried to do for India. The present times are critical, but full of hope, and we must all strive our best for the welfare of the people through peaceful progress.

Yours sincerely,

(Signed) W. WEDDERBURN.

J. MANGIAH, ESQ.,

Chodavaram.

DADABHAI NAOROJI.

25, KENNINGTON ROAD, LONDON, S.E.

4th October, 1906.

DEAR SIR,

I have received your kind letter of 9th ultimo and also a copy of your "Indian National Odes, with apology of poesy."

I thank you for sending a copy to me. It is interesting to see the Indian mind working in every condition of intellectual life.

The Hon'ble Gokhale has returned to India. I have returned the letter and packet to him.

With kind regards,

Yours truly,

(Signed) DADABHAI NAOROJI.

J. MANGIAH, ESQ.,

Chodavaram,

via Anakapalli, Vizagapatam, India.

**LORD JOHN MORLEY, The Secretary of
State for India.**

INDIA OFFICE: WHITEHALL, S.W.,

10th December, 1906.

DEAR SIR,

I am desired by the Secretary of State to acknowledge the receipt of your letter of 21st November, enclosing for his acceptance a small book of poems entitled "Gleanings of a Rambler."

I remain, yours faithfully,

(Signed) W. H. C. WYLLIE, LIEUT.-COL.,

Political A-D-C.

JAYANTI MANGIAH, ESQ.

SIR HERBERT ROBERTS, Member of Parliament.

27th November, 1906.

DEAR SIR,

Mr. Herbert Roberts asks me to acknowledge your letter of the 5th instant, and to thank you for sending him a copy of your volume of "Indian National Odes." He has perused the book with interest.

Yours faithfully,

(Signed) **FREDERICK GRUBB.**

MAHASHAY MUNSHIRAM, Governor, Gurukula.

DEAR SIR,

I acknowledge, with thanks, the receipt of five copies of your beautiful poem on the Gurukula, which has been read by me and the Gurukula students with much interest.

I remain,

Yours sincerely,

MUNSHIRAM.

SIR S. SUBRAMANY IYER.

As regards the pamphlet ("To Gurukul") the praise which it has received from those high authorities whose opinions you have obtained renders it scarcely necessary for me to add mine.

THE PIONEER

OF SIMPLIFIED SPELLING.

KONTENTS.

English Spelling (Sir Harry Johnston).—Dhi Isropik Alfabet (W. H. Thompson).—The Printer and Spelling.—Impruving the English Langwij.—The Montessori Method.—From Neer and Far.—Korespondens.—Chart ov the Membership ov the S.S.S., March, 1913—Aipril, 1914.—Noets and Nyuz.—Pres Katingz.—Editorial Noet.

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THE PIONEER

OV SIMPLIFIED SPELING.

VOL. III, No. 5.

MAY 1914.

ENGLISH SPELING.

Bi Sur HARRY JOHNSTON, G.C.M.G., K.C.B., D.Sc.

TU mi thinking, the graitest impuls tordz speling reform kumz from the ambishon on the part ov seventi-fiev milionz ov English-speaking peepl in the Oeld Wurld, and a hundred milionz ov English-speaking peepl in the Nyu Wurld, tu maik English the grait wurld langwij, a natyurali born Esperanto, an internashonal meedium ov komyunikaishon which shal, tugether with an internashonal sistem ov waits and mezherz, an internashonal poestij stamp, koin valyu, siëntifik noemenklaityur (aulredi in egzistens), myuzikal noetaishon, alfabet, relijon, and lau, bring neerer and neerer that yunivursal federaishon ov man which aloen kan konstityut the Milenium.

Yet this wurld-wied adopshon ov English wil never be braut about so long az the langwij iz riten and printed in its prezent ilojikal fashon. Nor wil our pozishon be beterd if we reespel our langwij, but again duu so in a pekyuliar wai and without eni referens tu the akseptashon ov the Latin alfabet abraud. It iz, in mi opinion, fyutiel tu atemt speling reform unles we desied upon a sistem which iz az neerli az posibl in agreement with the moest reezonabl yus ov the Latin alfabet in uther kuntriz, in Spanish or Portuguese-speaking South and Central America, in Suthern Europe, in Western Slavdom, in Japan and Scandinavia, and in a grait mezher in Germany, Hungary, and Rumania.

I hav been ashurd when in India, and much mor reesentli bi meni Indian vizitorz tu this kuntri, that the prezent irashonal speling ov English, so entierli out ov korespondens with the yus ov the Latin alfabet in uther kuntriz, iz a grait bar tu the inkreest lurning and yus ov English thruout India and Burma. An Englishman hu had held an ofishal skolastik poest in Burma for meni yeez returnd thens ten yeez agoe, rezolvd tu devoet hiz penshond egzistens tu

emfasiezing the point and deviezing a fonetik speling ov English for yus thruout the Indian Empier. Az far az I noe, he woz never aibl tu get eni English publisher tu prodyus hiz wurk, tho I lookt thru it and thaut it thuroeli praktikal. It woz, in fakt, litl els than the adopshon for English ov the ekseleent speling which haz been enforst bi the Indian Government for the rendering ov vernakyular langwijez and naimz intu Latin leterz. This reformer meerli wisht tu treet English az the Indian Government treetz the naitiv langwijez ov India when it wishez tu ekspres thair soundz in Latin leterz. Az ten yeez hav paast, and I hav hurd no mor ov this reformer, I imajin he must hav been asasinaited in sum bak ali ov Paternoster Row or Fleet Street.

Perhaps wun ov the best waiz ov efekting a reform which aul far-sieted pursonz must dezier tu acheev befor it iz tuu lait, and befor English az a meenz ov inter-komyunikaishon haz been abandond bekauz imposibl in its orthografi, wood be for a konferens ov American and British ekspoenents ov fonetik speling tu meet, iether in the United States or in sum English or Scottish siti, and thair agree upon a standerd ov English pronunsiashon, which wood be regarded az orthodox and ov yunivursal aplikaishon, a standerd which thai wood rekomend tu be taut aliek in the skuulz ov the United States, ov Canada, Australia, South Africa, New Zealand, India, and Britain. Thai kood at the saim tiem, bi a majoriti ov voets, set forth whot thai beleevd tu be the moest reezonabl reformd orthografi ov the langwij in akordans with orthodox pronunsiashon, and az much az posibl in akord with the European valyuz ov the leterz, so that the alfabet yuzd for English miet be neerli the saim az that yuzd for the Western Slav langwijez, Italian, Spanish, Portuguese, Danish, Swedish, and the aksepted rendering intu the Latin karakter ov the wied-spredd langwijez ov India, Japan, and Negro Africa.

AND when he iz a yung sitizen at skuul he iz forst tu spend about tuu ov the best yeez ov hiz lief in lurning that aulmoest everi leter ov the insain British alfabet iz pronounst in so meni diferent waiz that it wood be aulmoest az cheep tu hav no alfabet at aul. No purson hu iz driven at the whak ov the kain tu beleev, kontrari tu reezon and konshens, that c soundz the saim az k, and that ool- is "colonel" soundz az kur (which it reali duzn't bekauz the u sound in "colonel" duzn't apeer in the alfabet at aul) haz a riet tu kaul himself free. He iz much mor liek a slaiv. It iz a thousand tiemz eezier tu beleev in transubstanshiaishon than tu poot implisit faith in the pronunsiashon ov the English langwij. Yet the miserabl surf-kid iz driven tu skuul and spankt if he hazn't beleef in theez and a hundred eekwali fuulish propozishonz.—The "Bulletin," New South Wales.

DHI IUROPIK ALFABET.

AT nou soebisikwent steij ov hiz kariir iz a doktor kwait sou hapili sitiueited az hwen hii iz on dhi haus staaf ov a hospital. Bcerstiq with niuli akwaird nolij, hii nouz egzaktli hwot iz best for evriwœn, and dhi peishœnts ool hav tu duu jœst hwot hii telz dhem. Leiter on, in praivit praktis, hii lœrnz dhat dhi riali vaital kweschœn iz not "Hwot shal ai tel dhi peishœnt tu duu?" boet "Hwot iz dhi best kors dhat ai kan indius dhi peishœnt tu adopt?"

Az a yœq man, Alexander John Ellis, in konsœlteishœn with Isaac Pitman, had nou difikœlti in daiagnouziq dhi trœbl from hwich dhi British pœblik woz œferiq, nor in preskraibiq Fonotipi az dhi korekt triitment; boet hii faund dhat dhi peishœnt refiuзд pointblaqk tu hav enithiq tu duu with sou drastik a remedi, dekleiriq dhat dhi kiur woz wœrs dhan dhi dziiz. Lukiq bak on dhi insident in dhi lait ov forti yïrz akiumiuleited ekspiiriens, Ellis woz dispouзд tu bleim himself for haviq, with iuthful impetuositi, preskraibd dhi aidiaal kors tu an insœfishœntli ediukeited peishœnt. Niu leterz, hii dhen sorofuli konfest, meit stil bii dhi kaunsel ov perfekshœn, boet it wud ounli bii bai juudishœs ius ov dhi ould wunz dhat dhi pœblik kud ever bii broot tu aprïshieit dhi fakt.

Diuriq dhi forti intervïniq yïrz Ellis had thœroli tested dhi veiriœs weponz in hiz armori. In order tu distiqgwish ool dhi fain sheidz ov *Early English Pronunciation* hii had evolvd biz Paliotaip, hwail tu rekord kontemporari daialekts hii elaboreited hiz Glosik. Bouth dhiiz sistemz weir orijinali intended for speshal pœrposiz ounli, boet hii had not iuzd Glosik for loq befor hii faund dhat it woz a kompliit kiur for dhi speliq dziiz. Wœens agein, hauever, hii woz ahed ov hiz taimz, and faund dhat dhi remedi woz tuu streinj. And sou wii kœm tu dhi greit Speliq Reform autbœrst ov dhi leit 70'z.

In 1877 dhi English Spelling Reform Association woz started, and evriwœn set tu wœrk tu invent skiimz, reinjiq from dhi moust traiffiq modifikeishœnz ov aur prezent sistem tu dhi wiird Kiilik ov R. P. Bull.* Aparentli iivn Ellis woz parshali stiupifaid bai dhi

* Ai teiq tev qopis manzli zrev mai bvqcelar, van aw hvitx ai cend tv mai can ut Xiqaugov.

din ov ool dhiiz konfliktiq skiimz, for in hiz *Dimidiun Speling* hii atemted tu popiularaiz Glosik bai admitiq veirices ooltærnativ speliqz. Wœn kombineishœn ov sainz oolweiz indikeited wœn kombineishon ov saundz, so dhat dheir woz nou difikœlti abaut riidiq; bœt, in order tu luk mor laik dhi ould speliq, wœn kombineishœn ov saundz mait hii represented bai tuu or thrii diferent kombineishœnz ov sainz. Dhis iz jœst hwot Dr. Bridges propouzd dhi œdher dei.

Fainali, in 1881, Ellis put forwerd tuu kompromaiziz hwich, in dhi lait ov hiz vaast ekspiiriens, siimd tu kombain dhi minimœm ov inakiurasi with dhi maksimœm ov akseptabiliti. Dhiiz weir Sœjestiv—hwich tuk dhi pleis ov Dimidiun—and Iuropik.

Wœn ov dhi fiu valid objekshœnz dhat haz ever biin advaantst ageinst reformd speliq iz dhat moust skiimz okiupai slaitli mor speis dhan dhi ould stail; and it iz tu miit dhis objekshœn dhat dhi daigrafs in S.S. ar rediust befor a folouiq vauel. It iz interestiq tu nout dhat Sœjestiv and S.S., ooldhou dhei weir evolvd entairli independentli, ar praktikali dhi seim eksept for dhis wœn fiicher.

Ellis'z beliif dhat dhi balans ov advaantij lei with dhi Iqglis vauel beisis, iz sheird bai dhi Komiti ov dhi S.S.S., and hidhertu nou œdher haz biin emloid in THE PIONEER. Bœt if a thiq iz wœrth duuiq, it iz wœrth duuiq wel; and memberz ar sou konstantli sendiq in kontinental skiimz, hwich feil dizmali hwen put tu dhi test, dhat it iz az wel tu giv an egzaampl ov a riali praktikal skiim on dhat beisis.

Az dhis entair artikl iz riten in Iuropik it iz perhaps œennesesari tu giv eni fœrdher eksplaneishœn, partikiularli sins the folouiq paragraaf woz speshali dezaind bai Ellis az a sœrchiq test for eni skiim:

“Aa, faadher, ai am shuur dhat dhat niu braanch ov aur Jorj'iz feiverit wud-bain, hwich iz grouiq niir dhi poust not far from dhi north wool ov dhi garden, mœst be seif tu mezher abaut tuu fiit or mor in leqth tudei, œnles œœm mis'hap iz okœrriq, or it haz sœdenli lost its vaital enerjji, for ai hav keirfuli obzœrvd its reit ov inkriis evri wiik dhis moenth, and nouted it daun akiuritli on iur sleit, and ai nou dhat it haz ekspiiriens nou veirieishœn, barriq wœns, diuriq a desperitli anoiq interval ov kould porriq rein.”

W. H. THOMPSON.

THE PRINTER AND SPELING.

THE Printer's Reeder, in komon with the rest ov the world, keenli feelz the rush ov our modern sivilizaishon. It iz inevitabl nouadaiz that books, magazeenz, nyuspaiperz, ets., shood be prodyust with rapiditi; and the reeder that kan suksesfuli turn out a grait kwontiti ov mater in a litl tiem iz in urjent rekwest.

The daiz ar for ever gon when a man kood be aloud tu waid thru a pruuf—furst, for "literals," "outs," "doubles," ets.; sekondli, for punktyuaishon and "stiel ov the hous"; and even thurdli, for sens and gramatikal niesetiz, tu sai nothing ov a forth reeding bi the reviezer, a fifth bi the author or editor, and a siksth bi the pres reeder for the finishing tuchez. A veri smaul proporshon ov the reeding mater nou submitted tu the publik kan be deit with in this thuroe and painztaiking maner. I suspekt that a good deel (espesiali in a nyuspaiper ofis) gets thru with wun reeding, and that a veri rapid proeses.

The kondishonz, tuu, under which the reeder duz hiz wurk ar diferent from thoez ov the oelden daiz. The iedeal iz: he shal sit in a plais apart from aul the busi ov the kompoezing room, from the perpetuual oepening ov the dor ov hiz sanktum bi unseremonius and flurid mesenjerz, and from the klik and ror ov tiepseting and printing masheeneri. In this iedeal piktyur he iz enfolded in an atmosfeer ov perfek serenity, with nothing tu disturb hiz filosofik kaam or tu ruff hiz Caxtonian digniti whiel he iz lisening tu the floing peeriodz ov the author az thai ar deklaimd tu him with graisful elokyushon bi the akomplisht asistant (or kopihoelder) at hiz sied.

Whiel this, or sumthing liek it, mai hav been hiz lot in the daiz ov Leksikografer Johnson, it iz nou far utherwiez, az aul present-dai reederz ar painfulli awair.

Enithing, then, which haz a tendensi tu redyus the presher ov present kondishonz must be welkum tu the fraterniti, for huuz benefi theez lienz ar pend bi wun ov themselvz.

It iz heerin klaimd that the Simplified Speling Sosieti haz provieded us with a skeem which, if adopted, woud sav a grait deel ov tiem and woud aulso konsiderabli lesen the aulmoest numberles posibilitiz ov tipografikal eror which nesesarili inheer in the konvenshonal speling.

From asurshon let us proceed tu demonstraishon in siks partikularz.

1. Taik the sheer difikulti ov speling. It iz fairli obvius that sum men hav a beter vizhyual memori than utherz (and upon this memori the hoel biznes hinjez—wun need not elaborait that point). Such men mai be dispoezd tu laaf at mi sueshon ov eni difikulti. But mai I ventyur tu poot a fyu kwestionz, krediting *m. confrères* with sufishent moral kurij tu fais them fairli and tu aanser them skwairli? Duu we ever hav tu refer tu the dikshonari? Whi, if not that we hav forgotten hou tu spel a wurd? Tu pres this mater a litl mor kloesli, hav we never murmerd tu ourselvz: Hou meni *u*'z in "innuendo," *l*'z and *n*'z in "millennium," *t*'z and *l*'z in "battalion," *s*'z and *c*'z in "abscess, abscissa, isosceles"; *e*'z in "ineffaceable, acknowledgment, unmistakable, saleable, rateable"; *r*'z in "harass, embarrass"? Whot about "paralyse, advertise, organize"? Hav we never been flord bi "recompense, adscititious, aqueduct, predilection, ipecacuanha, antediluvian, artisan, desuetude, desiccate, crystal, chrysalis, consensus, fuchsia"? Everi such difikulti vanishez bi the adopshon ov S.S. Its simpl ruul iz: wun sound, wun simbol. Dubl leterz ar yuzd oenli when sounded, az in "unnoen, dissatisfied," ets.

2. Dair we sai that we hav never been kapt naping and aloud wun ov the foloing wurdz tu paas for its iritaiting bruther—"peace, piece; pear, pare, pair; straight, strait; chord, cord; practice, practise; right, wright, rite, write; coarse, course; hale, hail; beech, beach; bass, base; acetic, ascetic," ets.? Such traps duu not ariez in S.S.; tuu or mor wurdz pronounst aliek ar spelt aliek. "Whot konfyuzhon!" it mai be retorted. Not at aul; the kontekst prevents that.

3. We mai not redili admit that our links ie haz at eni tiem been deseeyd bi the rezemblans ov outlien (in manyuskript mor than in print) prezented bi the

subjoined list: but duu not we remember that the kompozitor haz ofen given us wun for the uther, and that the kopihouelder haz faulen into the iedentikal trap when reeding tu us from the manyuskript? And it mai be that if I apeel tu our oeld frend the man in the street he wood koroborait me in saing that sum ov theez mistaiks hav been noen tu slip into print despiet the absurditi manifest in kontekst.

It wil be seen at a glaans that theez rezemblansez duu not egzist in the S.S. outlienz, which I giv in parentheses aafter the konvenshonal spelings:

Acid, acrid (asid, akrid); dear, clear (deer, kleeer); art, act (art, akt); taste, task (taist, taask); special, spinal (speshal, spienal); baldness, boldness (bouldnes, boeldnes); classes, classics (klaasez, klasiks); hearth, heath, health (harth, heeth, helth); interesting, intersecting (interesting, intersekting); country, county (kuntri, kounti); dance, dame (daans, daim); line, live (lien, liv); could, would (kood, wood); civil, civic (sivi, sivik); ever, even (ever, eeven); contrast, contract (kontraast, kontrakt); when, where (when, whair); mark, mask (mark, maask); part, past (part, paast); broad, board (braud, bord); officinal, official (ofisinal, ofshal); professional, professorial (profeshonal, profesorial); text, test (tekst, test); recourse, resource (rekors, resors); cash, each (kash, eech); vein, view (vain, vvu).

4. Hou we hav trembl'd at the mieti raj ov sum infloenshal individyual when he haz riten tu the ofis tu noe whi we hav daird tu depart from hiz rendering ov "license [noun], monies, shew, connection, pourtray," ets. Theez peeriodikal avalanchez ov invektiv wood no longer kompromiez our digniti or (far mor important from the printer 'z point ov vvu) waist the tiem ov the firm if the rashonal speling wer adopted: "liesens [noun or vurb], muniz, shoe, konekshon, portrai," ets.

5. I ventyur tu sujest that a c iz freekwentli printed for an e. It kan never hapen in S.S. C (which must be sounded iether az a k or az an s) haz no plais in the skeem. *Excunt*, thairfor, aul erorz ov that kiend!

6. Laast, but not ov leest importans, thair iz the grait advaantij that the kopihouelder wil no longer be stumbling along with that hauling and faulti pronunsiashon which (in the kais ov a youthful asistant) iz yuzhyuali inseparabl from our ridikyulus moed ov speling without ruul. Speeking from ekspeeriens, I feerlesli asurt that this urstwhiel bugbair ov the reeding department wil bekum a yusful, if not a charming, kompanion.

On eech ov the siks points, then, I respekfuli submit, an imens amount ov tiem wil be saivd. And tiem, in a printing ofis, iz a valyuaabl artikl.

IMPRUUVING THE ENGLISH LANGWIJ.

THAIIR ar tuu waiz in which whot Mr. Grant White hapili kauld "everidai English" miet be maid vaastli mor efektiv for its grait funksjon, the the ekspreshon and komyunikaishon ov thaut: the speling ov wurdz and presies meening ov boeth wurdz and fraizez. It iz not nesasari tu sai much in this konekshon about speling. Aul the grait English skolarz in aul English-speaking kuntriz ar speling reformerz. Aul hu noe enithing wurth noing about the histori ov the formz ov English wurdz ar aware that oeld English speling woz ment tu be fonetik, that the apairent vagairiz ov oeld speling wer kaudz cheeffi bi kaprishus chainjiz ov pronunsiashon and bi natyural but fyutiel efforts ov the speling tu ajust itself tu chainjez ov sound. When Milton wanted the paast tens ov "sai" tu riem with "fed" he spelt it "sed"; when he wanted it tu riem with "maid" he spelt it "said" or "sayde." Modern fikst speling ov English iz not "good oeld" speling, bekauz it iz niether good nor oeld; it iz bad fonetikali, bad filolojikali, and bad praktikali, and it daits larjli from the tiem ov the furst grait leksikografer Samuel Johnson. Thair never woz in eni altruistisk kruusaid so kompleetli a wun-sieded argument az that for the reform ov English speling.—From a leeding artikl in the "Toronto Globe."

THE MONTESSORI METHOD.

MIS SIMPSON, Lekturer in Kindergarten tu the Sydney Training Kolej, haz been eksperimenting for the laast yeer with the Montessori sistem in the praktising skool at Blackfriars. Tu kwoet from the "Times Educational Supplement":

The furst report ov a yeer's eksperimental wurk haz just reecht this kuntri, and the results ov the Montessori klaas in Sydney ar moest interesting. Children broek intu rieting ov thair oen akord and without eni formal teeching. The fonik elements wer maasterd and aplyd bi moest children in tuu weeks. Wun chield maid forti wurdz with kardbord leterz in the furst ten daiz—wurdz not sujested bi the teecher, but hiz oen. Aafterwerdz kaim sentensez and paragraafs, and at this staj the children seemd tu be seezd with an akuyt reeding feever. Everiwun woz bizi and hapi, and in the faisez ov direktorz and children shon the joi ov acheevment.

The Montessori prinsiplz hav nou been suksesfuli karid out in skuulz atacht tu the Kolej. Children lurn tu reed and riet without mental strain, and the teecherz deklair thaj kood not revurt tu the oeld sistem ov klaas teeching on eni konsideraishon whotever.

In the liet ov this report—or perhaps he iz stil laiboring in outer darknes—it iz kyurius that Mr. Caldwell Cook shood riet in hiz prefais tu No. 4 ov the *Perse Playbooks*: "The Montessori sistem, on the uther hand, iz mainli a negativ propozishon, and we mai ekspekt tu see its meejer pozitiv sied sufokaited befor long bi that absurd 'Material.'" Nou aul onor iz dyu tu Mr. Cook for the ekselent wurk he iz duing at the Perse Skuul, and the laitest book from the skuul iz another fether in hiz kap; but he must bewair lest hiz egzyuberans oevershadoez hiz juzment. In thus sumarili dispoezing ov the Montessori sistem and, in uther pleasez in hiz prefais, kaasting cheep jiebz at the Simplified Speling Sosiety and uther wurkerz, he seemz tu think that he haz found the oenli paath tu heven. If he haz, we hoep that he wil lurn in tiem tu travers it with mor hyumiliti.

FROM NEER AND FAR.

IN a kopi ov the "Toronto Globe," which haz just reecht us, iz the foloing leter:

In starting tu teech sum forinerz I woz graatli serprized tu fiend out that a paij ov our print, so kleer tu us, woz tu them simpli a mas ov puzl, and that no tiem or efort which thaj miet poot on aulmoest eni wurd wood enaibl them tu reed it korektli with surtinti. Reesentli I roet "is" on a blakbord and aaskt a klaas tu reed it. Thaj wer kwiet unabl, tho the wurd iz so short and simpl. I found that tu them the *i* miet be long or short, and the *s* miet be *s* or *z*. Thus "is" miet be sounded liek *iez*, or liek *ies*, or *is* az in "mis," or *iz* az we yuzhyuali pronouns it. But tu them wun wai woz az liekli tu be korekt az another. Thaj kood be shuur ov nun. Hens unlimited waist ov tiem and efort and kountles erorz. When this iz aded tu the fakt that Ontario iz waisting a milion dolarz yeerli on our senseles speling, besiedz luuzing a preshus yeer ov eech chield's edyukaishon and injuring thair reezoning fakultiz, we shuurli hav veri strong ground for suporting the leeding edykaitorz ov our Empier when thaj sai the need ov speling reform iz urjent.

Thair woz aulso a report ov the Anyual Meeting ov the Ontario Edyukaishonal Asoesiaishon, and it iz signifikant tu noet that wun ov the Sekshonz ov the Elementari Department ov that bodi iz the "Reformd Speling Sekshon."

THE Hed Mistres ov a London skuul riets :

I tried a fyu ov the children with the litl book yu sent, *Nurseri Rienix and Simpl Poëms*, and am delieted tu tel yu that theez children (bairli seven yeez ov aij) took it up moest redili.

"Mi oen vyu iz that wurdz shood be spelt az pronounst, but that a fyu ekstra tieps shood be introdyust insted ov yuzing the ekstra leterz."—Editor, "Newspaper Owner and World."

"Yu sai in yur leter that 'the printer iz the real autokrat' in the mater. *He izn't*. It iz the man hu paiz for the printing being dun—publisher, or author, or advertiezer—hu kontroelz the speling. Get a publisher and an author tu agree tu isyu a nyu novel, sai, in simplified speling, and yu see hou it selz, and yu wil then get an ieeda about yur speling that wil be a real survis."—Editor, "Caxton Magazine and Modern Lithographer."

"The British Parliment shood taik the leed in eni muuvment ov this kiend. A strong objekshon tu our yus ov Simplified Speling heer iz that the tail iz atemting tu wag the dog. We hav the advaantij, however, ov les prejoedis. We aulso noetis that in meni parts ov the wurld, az in Judea, the reform which started in ruural hilz ov Nazareth reecht Jerusalem veri much laiter. A nip on the tail mai turn the stoutest dog riet about. That's whi we ar niping."—Dr. A. H. MACKAY, Syuperintendent ov Edyukaishon, Nova Scotia.

"WOOD it be akseptabl or yusful tu hav on yur petishon for a Roial Komishon the ofshal signatyur ov the Ontario Braanch? I hoep veri sinseerli the Komishon wil be aaskt for bi a multityud'z petishon, that it wil be graanted, and that it wil duu sumthing at wuns radikal and efektiv."—Prof. JOHN DEARNESS, The Normal Skuul, London, Ontario.

MR. ANDREW BRODRICK, hu iz so zelus a suporter ov our wurk, riets :

I think yu wil be interested tu heer that Dr. Betta Taplin, ov Liverpool, huuz aplikaishon for membership yu wil suun reseev, if yu hav not aulredi dun so, iz a wel noen speshalist in the treetment ov dizeez bi Hipnotik Sujestion and an eks-Prezident ov the Sieko-Medikal Sosieta ov Great Britain. I understand he iz wel noen aul oever the medikal wurld az a moest suksesful pioneer in the treetment ov obstinait kaisez ov dizeez bi hipnotizm.

DR. RICH. BANGAY, ov New Tredegar, Mon., riets :

Thank yu for yur kiendli "welkum" tu the Simplified Speling Sosieta. Aultho I had never hurd ov the Sosieta befor, I roet tu Mr. Drummond that mi adopshon seemz liek a "hoem kuning," so much am I in simpathi with the muuvment. Siksti yeez agoe I thru mieself with grait zeel into Pitman's "fonetik" sistem ov reform. I am tuu oeld nou tu komens again, so the advaantij ov mi being a member ov yur Sosieta wil, I'm afraid, be aul on wun sied. Thank yu for the literatyur. I am pleezd tu see the kwotaishon from mi oeld frend William Morris on the frunt pajj ov *Simplified Speling*. Doent yu think it wood be a good thing tu advokait whot the Deen ov St. Andrews sed in publik the uther dai—"that everi wun shood spel hiz oen wai, and he hu kood riet moest reedabli shood be konsiderd the best speler." It struk me at the tiem that a revoluushon ov that sort wood be an ekselent thing: it wood krak the thik ies ov habit and kreait a terifik rou in the literari kamp, which wood

tend mor to braik up the glacial krust than enithing els. It wood prodyus an armi ov militant sufrajets that wood bring thair hevi stoenz and hamerz to the wurk ov fraktyuring the bloks. Such a fiet wood be shuur to leed, in a short tiem, to a kompleet reform—that ov having everi spoeken sound represented bi its aproepriait sien. A kompleet reform bi the Simplified Speling Sosiety's method wil taik aijez to akomplish, whairaz a revoluushon such az that sugestid bi the Deen wood bring it about in a much shorter tiem. Nevertheles, the Simplified Speling Sosiety iz duing moest ekselent wurk, and I am "the oeld man in a huri." I hav just red yur "Appeal," and hav absorbd everi wurd ov it. The hoel problem iz byutifuli diskust—so simpli, kleeerli, and forsibli poot that it leevz no plais for kontenshon.

MR. WM. F. CATES, ov the Edyukaishon Department, Melbourne, riets tu he Sekretari:

I hav tu aknolej yur reesent pamflets, and beg tu forwerd yu sum naimz ov nyu memberz. We ar aul ofiserz ov the Edyukaishon Department, az yu wil see.

Sum tiem agoe, at mi instigaishon, the Department maid a fyu simplifikaishonz in the speling in aul its publikaishonz—e.g. kuting *u* out ov "honour," and maiking *ize* duu dyuti for *ise* in aul kaisez. A grait storm raijd oever the mater loekali. Moest ov the nyuspaiperz wer hostiel or skornful, and moest ov the publik-skuul maasterz (non-Departmental) wer opoezd to the chainjez—sum ov them, I feer, just bekauz the Department maid them. It miet duu good if yu kood send theez hed maasterz a fyu ov yur reesent pamflets. I apend a short list. An ofishal leter haz aulredi been sent from this Department *re* the propoezd Langwij Komishon. I hoep yu wil be aibl tu get the asistans ov the Nyu York Simplified Speling Bord. I shal be oenli tuu glad tu help loekali in eni wai I kan. I hav aulredi sekyurd a grait meni adheerents for the kauz.

KORESPONDENS.

MR. OLDFIELD THOMAS returnz tu the charj in the foloing leter:—

I shood leik tu ekspres mei plezher that, in yur anotaishon tu mei leter on the subjekt ov *ei* for *ie*, yu admit mei main kontenshon—that *ie* for long *i* iz not satisfaktori, aultho yu ar stil advers tu *ei*. Mai I, then, trespas again on yur spais with a further konsideraishon ov the aulturnativz availabl?

Furst, yu shoe that *ei* iz nou yuzd with several diferent valyuz—az in "vein, ceiling, heifer, heir," etc., but shuurli the hoel *raison d'être* ov Simplifeid Speling iz the idiotik multityud ov such valyuashonz, and it iz our biznes tu get rid ov them. If the valyu that *ei* haz in "vein" wer reali the natyural wun the mater wood be diferent; but I ventyur tu think that, in spite ov that being [shood this be "being"??] the moest freekwent valyu, no wun speeks it instinktivli—oenli bekoz thai hav been taut it in thoez wurdz; and this iz thairfor an instans ov the unreleiabiliti ov the prinsipl ov kounting freekwensi tu test natyural valyuz.

Ov the aulturnativz menshond bei yurself and uther korespondents, y iz veri atraktiv at furst seit, but wun seez veri suun that it wil not duu, for it wil aulmoest invairiabl be pronounst short insted ov long; and this, indeed, iz in akord with wun ov the furst prinsiplz ov our Sosiety—that a vouel bei itself iz short.

Ov Mr. Banks'z three aulturnativz the oenli posibl wun iz *iy*, az neither ov the uther wunz wood be natyurali pronounst long *i*. Az tu *ih*, in meni,

if not aul, kaisez it wood sujest that sum atemt shoold be maid tu drag in an aspirait, and we wont no mor doubtful aspiraits, having mor than enuf with "what, which," & Co.

If yu wil trei the eksperiment on a number ov edyukaited Englishmen ov aasking the wai thai wood natyurali pronouns

<i>piel.</i>	a majoriti wood sai	"peel"
<i>peyl.</i>	" "	"pail,"
<i>pihl.</i>	" "	"pile" (aspiraited),
<i>pyl.</i>	" "	"pill,"
<i>piyl, piil, peil</i>	" "	"pile,"

the sound we wish tu get.

Kompairing theez laast three, the oenli wunz for which instinkt givz us the saut-for sound, (1) *iy* seemz kumberd and iz absoluutli unnoen in the langwij; (2) *ii* iz aukwerd oing tu its rezemblans in print tu a modifeid *u*, and seemz tu hav no frendz amung us. On the uthar band, (3) *ei* haz at leest sum instansez tu suport it—minimeiz them az yu mai—seemz simpl and natyural, and, tho we aulmoest ostentaishusli refyuz tu admit forin valyuz az eni geid, yet its egzakt ekwivalent in German tu the sound dezeird iz sbaurli not a disadvantij, az indeed Mr. Gundry noets.

[In diskusing the sujested yus ov *y* for S.S. *ie* we rekogniezd that, in wurdz ov the "time" tiep aloen, it wood not be reedabl at siet. This, however, mai wel be thaut tu be kounterbalanst bi the grait advantij ov having wun leter insted ov tuu. It iz obviusli a sound prinsipl not tu yuz tuu leterz whair wun kan duu the wurk, and eekwali sound tu maik yus, if posibl, ov the leterz that our puur alfabet proviedz. Let it be koneseed that "tym, typ, syt" ar strainj tu thoez hu hav been braut up on the oeld speling. Tu the kuming jeneraishon that starts with a rashonal speling thai wood prezent no difikulti. If it iz urjd (and with good reezon) that we must duu whot we kan tu render our rashonal speling reedabl tu thoez hu hav "lurnt tu spel," then it mai be aaskt ov thoez hu advokait *ei* hou the oeld speler wil reed thair "vein" (O.S. "vine"), "weir" (O.S. "wire"), "weird" (O.S. "wired"), "feind" (O.S. "find"), "veil" (O.S. "vile"), "heir" (O.S. "hire"), "seiz" (O.S. "size"), "slei" (O.S. "sly"), ets.?

The ekspreshon "natyural valyu" strieks us az sumwhot dainjerus. The reprezentaishon ov speech soundz iz a pyurli konvenshonal tbing. In English surtin diegraafs ar yuzd with fairli staibl valyuz. If I aask eniwun hou he pronounsez *sh* or *ee* thair kan be no dout az tu the aanser. If I put befor twenti peopl fansi wurdz liek "shab" or "seeg" thai wil aul pronouns them aliek. Thair ar uthar diegraafs which ar yuzd with several valyuz, such az *ea*, *oo*, *ie*, *ei*. If yu maik up wurdz kontaining theez, liek "meart, klood, flien, blein," peopl simpli doent noe whot tu maik ov the vouelz. Thai hav no "natyural valyu." Ov kors, wun hu noez German mai be temted tu giv German valyuz tu "flien" and "blein"; but supoez we poot "fieth" and "bleith" befor him—whair the *th* givz the wurdz an un-German look—whot then?]

Sins rieting the abuv we hav reseevd an interesting leter from Mr. HOGARTH, ov Johannesburg, in which he deelz with this veri kwestion amung utherz. We retain hiz speling:

The propoazd *ei* haz wun veri grait disadvantij—it duz not sujest the "long i" sound tu English speekerz hoo oanli pazes a komon skool edukaishon. For the purpos ov testing this I maid out a list ov thertiks wurdz—moastli koind wurdz without eni meeuing—and aaskt frendz tu giv the pronunsaishon which thai thaut the speling sujested. The result shoad that in neerli everi kais the form *ei* sujested the vouel ov "feed."

A nolij ov langwijez mai bias aul speling reformerz in faivor ov *ei*; but it wood be wel tu remember that the ordinari publik, for hooz suport and aprooval we kaiter, ar not infloenst by eni uthar tung.

Mr. Hogarth then givz a komparativ list ov wurdz tu shoe that the yus ov y loedz tu kleerer outlienz. We print a selekshon, in larj tiep, so az tu emfasiez the point.

dezeier	dezyer
beier	byer
kweiet	kwyet
soseieti	sosyeti
fleiing	flying
deinameit	dynamyt

He konkludz :

The objekshon that y, being a singl leter, and thairfor not aproapreat for the reprezentaishon ov a difthong, iz, I hoap, not a faital objekshon. Despyt its singlnes, I kan not help but think it performz aul the deutz pertaining tu the "long i" sound moast perfektli.

Mr. ARCHER WILDE, ov 84 Lexham Gardens, London, W., riets :

I wil not ask for spais in THE PIONEER tu replie tu "W. H. T.'z" kritisizm ov mi book on the alfabet, hwich iz fair and even jenerus, tho I duu not agree with aul he sez ; but wun point, with yur permishon, I shood much liek tu raiz. Evri number ov THE PIONEER kontainz long and aibl diskushonz ov the best diegrafs tu yuz for speling vouel soundz such az thoez ov "isle, pull, pool," and uther wurdz, and, in the kurent number, Mr. Gundry rielti points out the dezierabiliti ov avoiding diegrafs hwich wil giv riez tu ambigyuiti. For instans, he sez *ea* must not be yuzd bekoz the leterz stand for thair indivyual soundz in seekwens in "create, ideal," and uther wurdz. But kan eni diegrafs be found hwich ar not oopen tu this graiv objekshon? I think not, and it rekwierz pruuf that thoez he selekts (*e.g., ei*) ar eni freer from it than thoez he kondemz. The truth iz that this method ov diegrafs, bi hwich O.S. and S.S. aliek attemt tu eek out the defishensiz ov the preznt alfabet, iz radikali bad and doutfuli beter even than a sistem ov diakritiks, hwich moest ov us ar agreed in kondeming. Unles mi kalkyulaishonz ar sadli at fault, the English langwij, bi hwich I meen the real thing and not the poliglot travesti ov a langwij that paraidz az English in our books, iz maid up ov about forti diferent soundz. Hou, then, kan we posibli ekspekt tu denoet theez satisfaktorili with oenli wenti-tuu sienz—the preznt alfabet les *c, q, x,* and *j*, hwich laast must aulso be kounted out az a komound? The adopshon ov forti sienz for theez forti soundz wood at wun bloe dispoez ov aul theez difikultiz with hwich yuer korespondents so aibli, but az I think so frutlesli, strugl. Iz this imposibl? I beleev the iedea tu be a sort ov nietmair from hwich we aut at wuns tu awaik and tu asyum a rashonal liberti tu yuz az meni sienz az mai be found ekspedient.

[We reseev everi week skeemz ov English speling in which yus iz maid ov nyu leterz ; but hardli eniwun seemz tu realiz the fundamental difikulti ov the problem. If we ar tu adopt nyu leterz we kan not konsider the kwestion from a nashonal point ov vvu oenli. Uther naishonz wont tu impruuv thair speling, or wil suun wont tu duu so. The preznt variashonz ov skript and ov yuziz even among thoez hu yuz the Roman alfabet ar absurd. Thingz wood not be much mor satisfaktori if everi naishon wer tu set about deviezing nyu leterz for itself. Thair must be kooperaishon.

Az a mater ov fakt, an internashonal alfabet—that ov the Internashonal Fonetik Asoesiaishon—baz long been in yus. It iz the rezult ov ankshus kair and studi, and iz far mor wiedli yuzd than eni uther for teeching the pronunsiashon ov meni langwijez. Tu ignor aul the wurk ov the paast iz tu inkur the charj ov wilful bliendnes.

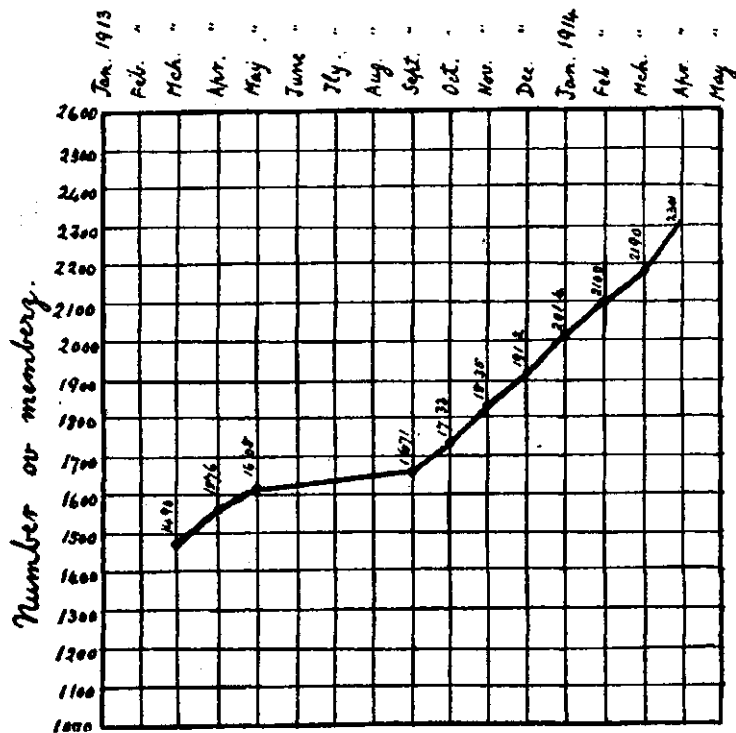
Anuther point in which maikerz ov nyu alfabets tuu ofen goe astrai iz that ov the praktikal yus ov thair leterz. Thai drau them on a larj skail ; sumtiemz the artistik efekt iz charming. Nothing kood be mor delietful than the skript

sujested bi the Poët Laureait. But redyus them tu the siez in which theez wurdz ar printed, masheen twenti thousand kopiz from stereotiep plaits, and yur opinjon wil chainj. Or, again, print everi letter ov the saim hiet, az Mr. Archer Wilde sujests, and yu destroi at wuns the iregyular outlien which iz so valyuaubl in enaibling us tu rekogniez wurdz kwikli, and thus helping us tu atain speed in reading.

Tu deviez nyu leterz iz no liet undertaiking. Rairli duu we meet with such an obviusli ekselent wun az the sien for *ng* adopted in the internashonal alfabet —naimli, *n* with the tail ov a *g*. And yet we mai aask ourselvz, aafter reeding (on anuther paj ov this number) the artikl on the "Europik" alfabet, whether *q* wood not duu just az wel!]

CHART OV THE MEMBERSHIP OV THE S.S.S., MARCH, 1913—AIPRIL, 1914.

THE figerz ar taiken from thoez publisht in THE PIONEER. Not oenli kan the aktyual membership ov the Sosieti at eni given dait be seen at a glaans, but the *raif* ov inkrees iz shoen bi the *stoep* ov the kurv. Dyuring the winter 1913-1914 the averij monthli inkrees haz been 86.



NOETS AND NYUZ.

The membership of the Societi nou numberz 2327.

A DAI in our "lair" (az the funi paiperz kaul it) opozit the British Museum, wood open the iez ov the unishiaited tu the far reeching naitur ov our muuvment. Everi morning'z poest bringz leterz from aul parts ov the world in pruuf ov the fakt that we ar not paroekial bizibodiz, az the mor ignorant ov our kritiks wood maik out, but pioneerz ov a far-flung reform.

UTHER pruuf ov the yubikwiti ov speling reformerz mai be found in the kolomz ov that organ ov liet, the "Daily Mail." Heer "Six Years' Resident," rieting from British Columbia, bewailz the fakt that American spelingz ar apeering in the tekstbooks ov the deer litl skuul children. Did "Six Years' Resident" but noe, theez ar but the furst sienz ov an emansipaishon ov the skuul children that wil sweep not oenli Canada, but the oeld kuntri az wel. Perhaps siks yearz' rezidens haz not been sufshent tu akwaint this rieter with the fakt that meni ov the hedz ov Edyukaishon Departments in Canada ar in faivor ov speling reform.

THE March number ov the "Simplified Speling Bord Bulletin," the organ ov the Simplified Speling Bord ov America, iz partikularli briet and inspiiring. Thingz "oever thair" ar progresing apais jujing from the enthyuziazm with which the wurk ov the Simplified Speling Bord iz being greeted. Meeting aafter meeting iz endorsing the planz ov the reformerz. At a gathering ov the Washington Stait Teecherz' Asoesiaishon at Spokane, in Janyuari, tuu thousand teecherz adopted a rezoluushon komending the wurk ov the Simplified Speling Bord and faivoring the yus ov shorter and simpler formz in skuulz. Oever three hundred teecherz at the Spokane Kounti Teecherz' Instityut paast a similar rezoluushon. At the anyual meeting ov the Idaho Stait Teecherz' Asoesiaishon the foloing rezoluushon woz poot and karid :

Whairaz, English speling iz kaiotik, ilojikal, unsiëntifik, and kumber-sum, and much tiem, muni, and efort ar waisted in teeching, lurning, rieting, and printing yusles leterz; thairfor be it rezolv bi the Idaho Stait Teecherz' Asoesiaishon, in anyual seshon asemblid at Boise, Desember 29-31, that the imeediait yus iz faivord ov the simpler and shorter ov aulturnativ spelingz aulredi in good yus; that a Komiti ov three on Simplified Speling be apointed bi the Prezident tu ko-operait with similar Komitiz aulredi apointed bi the Washington Stait Teecherz' Asoesiaishon and bi the Inland Empier Teecherz' Asoesiaishon.

The Missouri Stait Teecherz' Asoesiaishon haz aulso kum intu lien, not oenli adopting the rekomendaishonz ov the Simplified Speling Bord, but urjing the Stait Superintendent and aul uther edyukaitorz tu duu liekwiez. In Ohio the Stait Yunivursiti haz adopted the simplifikaishonz ov the Simplified Speling Bord for aul fyutur ofishal publikaishonz. We ar hapi tu kongratyulait our American frendz on thair reesent progres. If the seedz plaanted bi the Simplified Speling Societi duu not shoe abuv ground az kwikli az in the American soil, thai nevertheles kontain the jurm ov lief and at tiemz displai vigorus groeth. Wun karid in a "literatyr" enveloep tu Melbourne haz rezulted in the gain tu the Societi ov for ov the leeding edyukaishonists ov that siti. With them az leederz hu kan tel hou meni mor wil foloe!

MR. W. GUNDRY, M.A., Hed Maaster, Wissa Skuul, Asyut, wishez tu ekschainj leterz with wun ov our memberz. Mr. Gundry iz not a beginner in simplified speling, but wood liek tu keep in praktis bi koresponding. If eni ov our reederz ar interested in that fasinaiting kuntri Egypt, this iz an oportyuniti tu lurn deetailz at furst hand.

WE announs, with the deepest regret, the deth ov Dr. A. T. Mertens, hu paast awai on March 21 at Nimeguen, Holland. Dr. Mertens, a lief member ov the Simplified Speling Sosiety, was an English Maaster in Nimeguen, and realizd in hiz avokaishon the advaantijez ov our sistem.

THAT we ar not the oenli peepl hu ar looking tu the integri ov nashonal langwij apeerz in the foloing kuting taiken from the "Daily Express":—

France iz geting tierd ov yuzing English wurdz in aul her sports. A Leeg for the Pyurifikashon ov the French Langwij dezierz tu duu awai with such turmz az "un dribbling" and "des goals" in footbaul and "des upper cuts" in boksing. It iz propoezd, nou that France haz furmli establish itself az a sporting naishon, tu substityut wurdz az foloez:—*Criquet* for kriket, *soule* for footbaul, *batteur* for batsman, *guichet* for wiket, and *lanceur* for boeler. Tennis, it iz pointed out, kumz from the French wurd *tenez*, as it woz wuns kauld in France, eeven az poeloe woz wuns noen az *chicane*. Wil England retaliat bi drieving out French wurdz from its kookeri books and fashion noets?

No. England wil retaliat bi heeping koelz ov fier upon the hed ov her Gallik kuzin—so simplifying her speling that Gallia mai run and reed—and pronouns.

IT iz amyuzing that Mr. Bernard Shaw's laitest sprat haz kaut aul the whailz—wun aulmoest roet "wailz"—ov kritiks. Theez eminent jentlmen hav been so bizi gobling at a litt nauti wurd and chastiezing the author (for provieding them with mateerial whairwith tu fil thair kolumz) that thai hav faild tu noetis the signifikans ov "Pygmalion."

IN the plai, Higgins, vurst in the theori and praktis ov fonetiks, taiks Eliza Doolittle from her flouer-stand in the London Street and, bi training her tu speek akording tu her kumpani, enablz her tu paas in West End Sosiety.

NOU, Mr. Shaw mai wish tu emfasiez the importans ov fonetiks or meerli tu belitl the konvenshonz ov speech which in the saim kuntri kan kut of klaas from klaas—oenli Mr. Shaw kan tel. But, if thair iz wun thing tu be gleend from hiz plai, it iz not that it kontainz a nauti wurd which the kritiks hav freekwentli, and inakyraili, staited never tu hav been ynzd on the English staj befur, but it iz that if we had a standerd ov pronunsiashon it woud tend tu loer the barierz between the diferent klaasez ov the komyuniti.

TURNING oever our fielz reesentli we found a leter from Dr. Macan, Maaster ov Yunivursiti Kolej, Oxford, hu iz nou wun ov our Vies-Prezidents. He sez—the leter iz daited November 15, 1908—in forwerding aplikaishon and chek for Lief Membership: "For at leest thurthi yeez I hav been a konvinst and ardent advokait ov a reformaishon in English speling. Prof. Max Müller konvinst me that filolojikal siens woud gain raather than luuz bi reform. Dr. Gladstone pruuvd that the literari edyukaishon ov the peepl woz woefuli retarded bi our present orthografi. M. de Candolle haz on good groundz promist an aulmoest yunivursal emploiment ov English in the wurld—a konsumashon which our present speling shuurli retardz. A meerli simplified speling mai not kari us veri far, but it mai prepar the wai for a reali sientifik speling, and in that hoep I join yur Sosiety."

FROM "H.B.B." we hav reseevd this amyutzng noet, which he entietlz "Simplified Speling and Famili Prairz":—Sum yeez agoe it woz our kustom at famili praizr tu reed a porshon ov Skriptuur, eech person taiking a vurs in turn. Nou it hapend wun morning that we reecht the 11th chapter ov Joshua, in which the wurd "hough" okurz. The reeder ov vurs 6 sed, "Thou shalt hou thair horsez, and burn thair chariots with fier." This raather tikld sum ov us. The reeder ov vurs 9 woz not satisfied, and red, "He huft thair horsez and

burnt thair chariots with fier." This sekond mistaik provoekt a ror ov laafter in spiet of the solem okaizhon, and this method ov famili prairz had tu be abandond for the fyutyur, and whot maid it wurs woz that the laafter woz led bi a distingwisht kanon'z daunter hu woz present on a vizit and hu aut tu hav noen beter!

AMONG the moest spirited ov our urli simplifiëرز woz Deborah, the aimiabl wief ov Benjamin Franklin. Wun ov her veri rair leterz beginz boeldli in this maner: "*This day I received yours, and it was the more exceptabell as I have been vercy ill. I have had a bad cold and fever it did not leve me for 48 owers and gave me much pain indeed, but is gon of again thank God for his mersey to me.*" She goez on tu speak ov her good man, on huuz "*a Count*" she woz in sum konsum, for at the tiem, it seemz, he woz at see, and "*as I suppose near the lands end of England and of Corse in danger of being taken.*" Sally Franklin woz taiking lesonz in French. "*I had no desire.*" sez Mrs. Franklin, "*of her larning that language, but shee desired it herself and her master ses shee is a good gurle. She has bin a week to day at it.*"—From the "*New York Evening Sun.*"

Duz it not striek yu that thair iz mor etimolojikal valyu in the "rong" spelings which throe liu on the pronunsiashon in Mrs. Franklin'z daiz than in aul the "korekt" spelings which tel us nuthing about it? A speling iz ov valyu tu the etimolojist in direkt proporshon az it reprezents kon-temporari speech.

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PRES KUTINGZ OV THE MUNTH.

Aipril.

SPEŠHAL ARTIKLZ ON SPELING REFORM ("A Standard for the King's English," "English and the Foriner," "Loekomoetivz and uther Reformz," "Simplified Speling," "The Printer and Speling," "The Revizhon ov Speling") apearđ in: Birkenhead News, Bombay Gazette, Bournemouth Guardian, Cochin Argus, Eastern Bengal and Assam Era, International Police Service Magazine, Freshwater, Totland, and Yarmouth Advertiser, Glamorgan Free Press, Glasgow Weekly Herald, Largs and Millport Weekly News, Secondary Education, Torquay Directory, Western Mercury, Whitby Gazette, Woolwich Gazette and Plumstead News.

THE FOŁOING LEKTYURZ ar reported: Gloucester, Gloucester Citizen; Greenwich, Kentish Mercury; Headingley, Leeds Young Liberal.

LETERZ AND ARTIKLZ OPOEZING SPELING REFORM wer printed in: Commercial Education, Daily Herald, London Quarterly Review, Printers' Engineer, Schoolmaster.

LETERZ IN SUPORT OV SPELING REFORM apearđ in the foloing paiperz:— Birmingham Gazette, Daily News, Dewsbury Reporter, Glasgow Herald, Journal of Education, Kentish Mercury, Manchester Evening News, Northern Daily Mail, Pall Mall Gazette, Standard, Stroud News, Western Mercury.

REFORMD SPELING woz faivorabli refurd tu in artiklz and paragraafs printed in: Adelaide Observer, Darlington Echo, Ontario Free Press, Schoolmaster, Standard, South of India Observer, Sydney Evening News, The Kindergarten-Primary Magazine.

AN EKSTRAKT from THE PIONEER for Aipril woz kwoeted in the Primitive Methodist Leader, and ekselent revyuz ov the thurd edishon ov our booklet, *Simplified Speling*, wer given in the Music Student and the Literary Guide.

 EDITORIAL NOET.

THE PIONEER iz publisht everi munth, eksept for tuu munths in the sumer. The Editor'z adres iz 45 Ladbroke Grove, London, W.

THE PIONEER iz sent graitis tu aul Memberz ov the Simplified Speling Sosieti. The anyual subskripshon for Asoeshiait Memberz iz a minimum ov wun shiling, that for Aktiv Memberz a minimum ov fiev shilingz. Mor muni meenz mor pouer tu kari on the kampain.

Memberz ar urjd tu aplie for leeflets seting forth the aimz ov the Sosieti. Theez and aul uther informaishon wil be gladli sent bi the Sekretari ov the Simplified Speling Sosieti, 44 Great Russell Street, London, W.C.

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PREFACE.

This lecture, delivered on the invitation of the Ceylon Social Service League by one who has had practical experience of education in the United States of America and Ceylon, has been reprinted because it deserves a wider circulation and in a more permanent form than it has had in the local press. It cannot fail to stimulate and guide thought among all persons interested in Education, the most vital of all our questions. The reprint has not had the benefit of Mr. Kunz's revision, as he has left the Island, to its great loss not only in the educational world but in the field of Social Service, where his self-sacrificing work in the slums of Colombo has been an example and an inspiration.

The contrast between the U. S. A. and Ceylon is striking, both in the actual conditions and in the aims of education. In the U. S. A., out of a population of 96 millions, 7.7 per cent. is illiterate (including the large negro and immigrant population). In Ceylon as much as 73.6 per cent. is illiterate (females alone 98 per cent.); that is, the illiteracy is 10 times as great with a population 24 times smaller than the U. S. A. Compared with some Oriental countries, also, Ceylon scarcely makes a creditable show. Japan, with a population of 70 millions, has in 50 years absolutely wiped out illiteracy. Ceylon, with a population of 4 millions, has not been able to reduce illiteracy appreciably after over a hundred years of British rule. Elementary education is neither free nor compulsory in the greater part of the island, and, where it is, the provision for it is insufficient. In the Capital city of Colombo it is wholly lacking for about 12,000 children, most of them wandering wild in the streets. During the last three years the Ceylon Social Service League has succeeded in bringing home to the authorities their responsibility, and two schools are in course of erection which will provide for perhaps 5 per cent. of the children.

Ceylon under its ancient kings had, like Burma, a system of primary education conducted by Buddhist monks in their *pansal*. Wijaya Bahu III., who ruled at Dambadeniya (circa 1240), "established a school in every village," says an ancient Chronicle,

“and charged the priests who superintended the same to take nothing from the learners, promising that they should be rewarded for their trouble by himself; and thus every day infinite crowds of priests were daily at the King’s door, receiving rice and clothing for their trouble of teaching; and for the higher order of priests who did not move from their temples, the King ordered their victuals and what they wanted to be sent; he also examined the progress made by the pupils, and according to their merit in learning, promised them that they should be made priests; and the most eminent among them he appointed to particular stations to preach. Having brought religion and learning to this flourishing state, the king exhorted all ranks to persevere in this manner, and thus greatly encouraged religion.” (Upham, *Raja Ratnakari*, p. 99). Custom required every male to spend part of his boyhood as an attendant at a Buddhist monastery, serving the monks, receiving instruction from them and qualifying for monastic life, even if he did not advance as far as the noviciate. In spite of the disordered state into which the country was thrown during the long struggle with European invaders in the 16th, 17th and 18th centuries, education was fairly well maintained and was not less wide-spread than the British found it in Burmah. The Ceylon Census Commissioner (1911) notes that in 1891 Burma showed a higher proportion of male literates than Ceylon in 1901, but has fallen off during the 20 years ending 1911. Mr. Denham thinks that it may be due to a higher standard of literacy being required by better educated enumerators. May it not be that education has declined for want of encouragement of *pansala* education by the authorities and from insufficiency of the existing schools (whether State or State-aided) to make up the loss? *

In Ceylon it is not recognised, as in all civilised countries, and specially in Japan, the U. S. A., France and Scotland, that education is the root of national life and progress. The responsibility of the State for the public education has been largely shifted to private bodies and individuals ill-equipped for the discharge of this important duty, and, by diversity of aims and practice, introducing an atmosphere of competition unfavourable to the interests of education. The expenditure on education is less than 5 per cent-

PREFACE.

of the public revenue, against 13 per cent. in the Indian state of Mysore (British India is not so fortunate), and 32 per cent. spent in the Philippines by the United States Government. In the U. S. A. itself the expenditure is 20 per cent. of the State revenue and 80 per cent. of the local taxation, in addition to vast sums contributed by wealthy persons who are numerous in that country. In Scotland, the best educated portion of the British Isles, education—elementary, secondary and higher—is so wide-spread and so well organised that one boy in four goes to the University. No wonder that, in every part of the Empire, Scotsmen hold a position quite out of proportion to their population. Education is not taken very seriously in England. The Bishop of Birmingham, speaking some time ago in the House of Lords, deplored the fact that Oxford and Cambridge were far too much merely plutocratic playgrounds. "The plain and present fact" said Mr. G. K. Chesterton, commenting on the Bishop's statement, "is that our upper classes regard the university as a lark." The English educational system, though it has failed to produce a high average of brain-power or knowledge, has succeeded in producing a high average of self-reliance, initiative, judgment, manliness, patriotism,—qualities which have helped to build a great Empire and have been conspicuous among all ranks of the troops at the Front. The War has brought home to the English people the deficiencies of their education on the intellectual side, and vigorous remedies have been proposed by Mr. Fisher, the new Minister of Education.

Our system of education, weak on the intellectual side, is still weaker on the moral. It certainly does not develop the qualities I have just mentioned. How can it, with the mother-tongue and the national history neglected in our schools, and our boys and girls growing up ignorant of the ideals, traditions and achievements of their race and, by dwelling exclusively on the achievements of others, hypnotised into self-depreciation and a sense of inferiority? No greater disaster can overtake a people. Mistral and his inspired brother-poets of Provence recognized that the soul and essence of a people lies in their language. "Forbid the tongue," says Gaston Paris, "and you almost kill the soul." "If thou wouldst that the blood of thy race maintain its virtue," says Mistral,

hold fast to thy historic tongue. In language there lies a mystery, a precious treasure . . . Every year the nightingale renews its feathers, but he changes not his note." How different is the aim of the American school from that of Ceylon in regard to the pupil? "His education is saturated with patriotism, with the instinct to prize freedom, to know his own value." The Ceylon youth, both at school and in after-life, lives in an atmosphere of inferiority and can never rise to the full height to which his manhood is capable of rising. How can we expect under this system to breed good citizens, manly, self-reliant, upright, well-informed, public-spirited?

This system is, in fact, alien to the best spirit of Great Britain, which is thus happily expressed by a British statesman: "There are some people who seem to believe that the only way in which a great Empire can be successfully maintained is by suppressing the various distinct elements of its component parts,—in fact, by running it as a huge machine in which each nation is to lose its individuality and to be brought under a common system of discipline and drill. In my opinion, we are much more likely to break up an Empire than to maintain it by any such attempt. Lasting strength and loyalty are not to be secured by any attempt to force into one system, or to re-mould into one type, those special characteristics which are the outcome of a nation's history and other religious and social conditions, but rather by a full recognition of the fact that these very characteristics form an essential part of a nation's life and that, under wise guidance and under sympathetic treatment, they will enable her to provide her own contribution and to play her special part in the life of the Empire to which she belongs."

Primary education, inefficient and ill-organized, advances slowly and languidly in Ceylon. Secondary education is in a worse state, and higher education non-existent. The high-sounding name of Colleges assumed by our secondary schools hides the poverty of their equipment. Instruction in science and manual arts is generally crude and feeble, and vocational training wholly absent. The lack of a University, deplored but not remedied by successive Governors, stunts the education of the youth of the country and impedes the growth of culture. The University College, which was decided on ten years ago by Sir Henry McCallum and was to be the prepara-

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tion for a University, is still in the future. Manufactures and industries, latent wealth of the country and an imperial asset, remain undeveloped. Neglected and wasted, too, is that industrial and artistic skill which is conspicuous in the few arts and crafts that have survived, and which little more than a hundred years ago extorted the admiration of European nations by the production of "the best and handsomest artillery in the world," and "the finest firelocks." *

Compare with this the splendid record of the U. S. A. as disclosed by Mr. Kunz. See what Japan has done since 1863. The whole of her child-population of six and half millions, male and female, between 6 and 14 years, is under instruction in over 26,000 schools. For secondary and higher education there are 303 middle schools, 117 high girls' schools, 78 normal schools, 5,682 special and technical schools, 3,128 other schools and 4 universities. The Tokio University (says the English scientific journal *Nature*, envious of the opportunities enjoyed by Japanese students), which was a generation ago a high school, is now (July, 1915) a highly organised university where scientific research lives and thrives. It consists of six colleges—law, medicine, engineering, literature and science and agriculture—and employs close on 400 professors, assistant professors and lecturers. Among the science professors are included 4 in mathematics, 3 in physics, 2 theoretical physics, 4 chemistry, 3 geology, 3 botany, 2 zoology, one each in mineralogy, geography, seismology and anthropology. The Technological Institute in Tokio is probably without a rival in the world.

What would our youth not give for a tithe of these opportunities? With such facilities, what might not be achieved for our country by a people with the intellectual keenness and inherited culture of the Ceylonese? Just before the War I had the opportunity of studying on the spot the educational system of France. At the Sorbonne, which is the name of the ancient and famous University of Paris, and which had over 17,000 students, including 3,384 foreigners, the best education in the world was given at a yearly cost to the pupil of £6, i.e., less than is paid in a secondary school such as the Royal College of Colombo. In the College de France,

* De Couto (1597), Faria Y Souza (1666), Pyrard de Laval (1679), Linschoten (1805, etc.

where advanced work and research in every branch of knowledge is conducted by Professors of world-wide reputation, the teaching is absolutely free. The facilities for study afforded to poor students in France were to me amazing. One winter evening I dropped in about 7 at one of the numerous public libraries in Paris, the Bibliotheque Ste. Genevieve, and found in the Reading-room about 100 students. Though I was a stranger without introductions, I was permitted to take my seat among these readers and to call for any of the splendid books of reference and other works in all languages. I stayed there reading till 10 p.m. when the institution closed. I noticed that the students were for the most part exceedingly poor, in ragged clothes and pinched with hunger. Apart from the books placed at their disposal, they must have appreciated keenly the light, warmth and comfort of the rooms on such a cold night. In the chief library of France, the Bibliotheque Nationale, reputed to be 'the richest library in the world, the newspapers reported at the time that the authorities were faced with the invasion of the books by vermin introduced by the poor students. But there was no thought of excluding them on that account. In Ceylon there is not a single library of any value for rich or poor, and of course no free library.

The fees in the high schools of Ceylon are prohibitive to the poor, though it is among them our best students are found. It is unfortunately true, here as in other countries, that the children of the rich care little for education, and, with rare exceptions, only swell the idle, useless throng, while the poor student, having undergone the wholesome training of frugality in youth and stimulated by his necessities and often by a noble ambition, appreciates education and utilizes his opportunities and rises to be an ornament and benefactor of his country.

In the intellectual famine from which we are suffering, we are fast losing, if we have not already lost, that rich treasure of inherited culture which made our peasantry about the finest in the world. Robert Knox, after living 20 years among them as an unwilling guest of King Rajasinha, says (in his *Historical Relation of the Island of Ceylon*, 1681) that the ordinary ploughman had the elegant speech and the elegant manner of the courtier. Of what

other people in the world could this be said? Wide-spread and deep-rooted must have been the national culture, unlike the culture of modern nations, which seldom penetrates beneath the upper levels of society. Knox quotes with approval the peasants' saying: "Take a ploughman from the plough, wash off his dirt, and he is fit to rule a kingdom." What superb self-confidence! What height might not such a people attain under the leadership of statesmen moving with the times!

We are in a critical period of transition in our history. We have all but lost our ancient culture. The old ideals, traditions and sanctions have disappeared, and nothing has yet taken their place as a system of national culture. The matter of immediate and of supreme importance is to supply this defect and improve upon the old methods. This, many of us are convinced, can only be done by the development of higher education, by the diffusion of the best Western culture happily blended with our own. We must proceed somewhat on the lines which have proved so successful in Japan. We must, as Japan did, develop our own soul, and not seek to borrow another.

Our youth, brought up at school on the Cambridge or London pabulum, are, as a rule, scarcely able after a dozen years' study to write or speak English correctly; they have little taste for good literature and restrict their reading to the gossip of the daily paper and to trashy novels and magazines. They remain strangers to Western culture, however much they may strive by adopting the externals of Western life—dress, food, drink, games, &c.—to be "civilised" in the Western fashion. The few, who have assimilated Western culture and whose mission it should be to interpret the West to the East, are disqualified for that great office. Having passed through a curriculum in which their mother-tongue is proscribed, they have grown up in deplorable ignorance of it. There is no prospect of the greatest need of the country being supplied—viz, a good modern Sinhalese and Tamil literature, instinct with the best spirit of the West. Only by the creation and spread of such literature can what is good in European civilization be brought within the reach of the people, and become, as it has in Japan,

part of their life and character and contribute to the vigorous growth of national life.

It has been truly said: "At all times, perhaps, the central point in any nation and that whence it is itself really swayed the most and whence it sways others, is its national literature, especially its archetypal poems The great literature penetrates all, gives hue to all, shapes aggregates and individuals and, after subtle ways, with irresistible power, constructs, sustains, demolishes at will. Why tower in reminiscence above all the old nations of the earth two special lands, petty in themselves, yet inexpressibly gigantic, beautiful, columnar? Immortal Judah lives, and Greece immortal lives, in a couple of poems The genius of Greece, and all the sociology, personality, politics and religion of those wonderful states, resided in their literature or æsthetics. What was afterwards the main support of European chivalry, the feudal, ecclesiastical, dynastic world—forming its osseous structure, holding it together for hundreds, thousands of years, preserving its flesh and bloom, giving it form, decision, rounding it out and so saturating it in the conscious and unconscious blood, breed, belief and intuitions of men, that it still prevails powerfully to this day, in defiance of the mighty changes of time—was its literature permeating to the very marrow, especially that major part, its enchanting songs, ballads and poems. To the ostent of the senses and eyes, I know, the influences which stamp the world's history are wars, uprisings or downfalls of dynasties, changeful movements of trade, important inventions, navigations, military or civil governments, advent of powerful personalities, conquerors, &c. These, of course, play their part; yet it may be, a single new thought, imagination, principle, even literary style, fit for the time, put in shape by some great Literatus and projected among mankind, may duly cause changes, growths, removals, greater than the longest and bloodiest war or the most stupendous merely political, dynastic or commercial over-turn." (Walt Whitman: *Democratic Vistas*).

Regarded not merely as an instrument of national culture and for the production of good citizens, but even from a purely material point of view, education, and especially scientific and technical

education, is of vital importance to us. Science is the most important factor of modern life, and the renaissance of Japan has shown how the life and character of a people may be revolutionized by scientific study conducted in the proper spirit and manner. I remember, as a boy, that Sir Coomara Swamy was unceasing in his advocacy of the study of Science and in his admiration of the Japanese, whom he held out to us as models. He looked forward confidently to their taking the high place which they have now won. Great was his delight when the first Japanese man-of-war, manned and officered by Japanese, called at Colombo on her first voyage to Europe. He invited all the officers to dinner and entertained them. I shall never forget the impression made on us by that scene. It is little more than a generation since Japan embarked on the policy of seeking Western knowledge. Col. Teruda, who led the first regiment throughout the siege of Port Arthur, had in his earlier days actually fought in chain-armour and carried a battle-axe. But here we are in Ceylon, after a hundred years of British rule, still almost as ignorant of Science as if it did not exist. What else can be expected when our educational authorities are ignorant and contemptuous of Science, and Latin and Greek hold a commanding place in our curriculum ?

By a properly organized system of education, our resources could be immensely developed. This has been done in agriculture by a small country like Denmark, and in industry as well as agriculture by another small country, Switzerland. A Swiss statesman said : " Most of our children are born in poverty, but we take care that they shall not grow up in ignorance." With a population smaller than Ceylon, Switzerland spends more pounds sterling than we spend rupees on education, which is admirably organized from her primary schools to the seven universities, which crown her system and attract students from all the world. The Agricultural College at Copenhagen receives a yearly grant from the State of three and a half lakhs of rupees, and there are twenty-one agricultural schools for an agricultural population half that of Ceylon, to supply whose needs we have but one small school of recent date, at Peradeniya. Switzerland and Denmark have by education so made

up for the poverty of their natural resources, that their trade is greater per head than that of Great Britain, being respectively £23 4s. and £33 against £22 16s. for Great Britain.†

There is, in my view, no more pressing need in Ceylon than the development of her industrial resources, a great store of wealth to her people and an imperial asset. Such development is impossible without scientific and technical education. Even in highly developed industrial states like England, such education on a great scale has been found absolutely necessary. How much more in Ceylon, where new industries have to be created, decaying industries revived, the value of labour-saving machinery taught and the dearth of skilled workmen supplied! Technical education should not be confined to workmen and foremen. The conviction has been growing and been largely given effect to in Europe, America and Japan, that success in manufacturing industry, in the higher walks of commerce and in every pursuit requiring technical knowledge, depends very largely on the thorough training of those who are charged with the control of the different kinds of work in which the army of operatives is engaged. These opportunities should be provided in Ceylon by the State. Until they are provided, students should be trained abroad at the public expense, and on their return their knowledge and experience should be utilized for the public benefit in the scientific departments of Government, in scientific and technical schools as teachers, in enterprises undertaken or aided by the State or wealthy individuals and bodies. It may be said that we have a Government Technical School in Colombo. The less said of it the better. It never had a fair chance and is now in a moribund state. I was recently a member of the Commission charged with the duty of inquiring into its condition and giving it, if possible, new life. Our recommendations, if carried out, will scarcely do more than make it a second-rate industrial school.

But we want a great deal more than this. The example of Japan should be followed. Industrially she was almost non-existent 50 years ago. Now she is a formidable competitor to Europe and

† *Whitaker's Almanac*, 1917, p. 107.

America. The steps by which she achieved her success are well-known. She made primary education free and compulsory, not merely in name, as in Ceylon, but in fact, and wiped out illiteracy among workmen and aristocrats alike. Numerous industrial, commercial and agricultural schools were opened in all parts of the country, so that youths should become skilled workers without having to go far from their homes to acquire the necessary knowledge. First class technical institutions were maintained in large centres to give advanced training. The Central Technological Institute at Tokyo, to which I have already referred, is reputed to be better than any even in the U.S.A. or Germany, and is almost the envy of the world. Promising students were sent abroad by scores and hundreds to Europe and America to acquire theoretical and practical knowledge of engineering and various arts and crafts.

In the seventies, when I was at Cambridge, I had as fellow students many Japanese youths who have risen to great distinction and contributed largely to their country's uplift. Many more went to France, Germany and the U.S.A. Economic bureaus were organized, where qualified foreigners trained Japanese to succeed to their positions in time. Factories were built or acquired by Government and often worked at a loss. Various industries were subsidised by the Government, and some of them are still. Noble men vied with the middle classes to subscribe capital, borrow money from abroad, and build up great industries. All this ingenuity, grit, enterprise and organization have enabled Japan to distance industrially all Asiatic nations and to compete with the best European nations. Unlike Ceylon, which sends her raw materials abroad to be finished and sent back and pays extravagant prices for them, Japan imports raw materials in abundance from abroad to feed her factories, mills and workshops,— wool from Australia, ores from China, cotton, jute, hemp, flax-indigo and oil-cakes from India, cotton also from the U.S.A. and Egypt. She would scarcely have been able to maintain her trade but for her foresight in building up a splendid mercantile marine and ship-yards to construct the largest ships.

Similar measures will be no less effective and fruitful here, and

are imperatively needed. What increase of wealth and strength would be ours and at the service of Great Britain! The present policy will only make Ceylon a helpless victim to economic exploitation by Japan, as hitherto by Western nations. Our helpless and perilous position has been brought home more than ever to all of us and to Government during this war. The Government will, I trust, lose no time to think out and organize effective measures to develop the great industrial resources and capacities of Ceylon to her best advantage on the lines that have proved so successful in Japan.

The ignorance and poverty of our people are almost appalling. Malaria, which modern science has shown can be mastered, claims its victims throughout the island by tens of thousands. Our Capital city is a nest of foul slums and the abode of tuberculosis, and plague has come to stay. The wealth of a nation, said Ruskin, is the health of its people. To this and all other wealth, moral and material, education is the sole path. We must deem it a sacred duty to bring to every child in the country the tools wherewith he may carve his way in life. We must provide the implements which even elementary education affords, and the opportunities of further self-improvement and progress. Secondary and higher education should not be the privilege of a few, but should be within the reach of all. We may not be able to reach the standard of some states in the U.S.A., or of the British Colony of West Australia, and provide an absolutely free university education. But we must realize with Mr. Joseph Chamberlain that "money spent on higher education is the best of all possible national investments." We must have a well-ordered series of elementary and secondary schools and colleges crowned by a University, which will systematise, concentrate and stimulate energies now dissipated; will render it impossible for our schools and colleges to go on in a drowsy and impotent routine and will lift the culture of our people higher and still higher. Such an organization will be a powerful instrument for forming character, for breeding good citizens, for developing the natural resources of our Island and increasing her prosperity and welfare.

P. ARUNACHALAM.

STATE EDUCATION IN AMERICA.†

IT is obvious that the scope of this lecture, as indicated by the title, is too great to be covered by a lecture of an hour or an hour and a half; for state education in the United States means virtually all the education in that country—the figures involved run into millions, and the historical aspect of the subject, if we entered into it—which we shall not—would take us through a period of centuries.

The precise area we propose to cover will appear as we proceed and need not now be defined; but I should like to say that my object in attempting so large a subject is to provide a wide outlook, a grasp of the subject as a whole; and this for two reasons: first, because our outlook in Ceylon is frequently too insular and limited and needs constant extension; and second, because the educational system under which we work in Ceylon is itself a patchwork, and to know how to reform it we need to look at other systems first as coherent wholes, and not, for the present, at their details.

I will ask you, therefore, to bear with me patiently in that portion of my remarks which surveys the great field and which may seem to lack vividness. I shall apply the discoveries we shall make together this evening to the state of education in Ceylon; which little land,

† I use the term state as equivalent to Government, and include City and Town Governments as well as the Governments of various States that compose the Union. When the word is capitalized it refers to a unit or units in the union.

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like every other country in the world, is seriously questioning whether her system for the training of the young is nearly as broad and strong as its importance warrants.

The American system of education provides these several phases that make it a most fertile ground for hunting out new ways and means:

First. There are crowded cities, like New York and Chicago, that have faced and to some extent solved the problems that, in a small way, are with us in Colombo.

Second. There are enormous rural areas that vary from the crowded districts in New-England through the less populated middle western states into the veritable desert lands in the West.

Third. There are problems of race mixture and interchange whose solution throws light upon the same, if more acute, situation here.

Fourth. America is detached from Europe and can and does show us an intelligent selection of elements from the varied European systems.

Let us go back, then, to that seemingly distant time before the war. In the year 1912 (which period I should be understood as taking for consideration throughout) there were 21 millions (21,192,113) of pupils on the rolls in all the Schools and Colleges in the U. S. A.

Two millions (2,173,186) only of these were in institutions not managed wholly by the State.

Over 90 per cent, thus, are state educated, and it must be remembered that part of the remaining, less than ten per cent, were learning in schools largely controlled by the state or city Governments.

It may be a surprise to some of my hearers to learn that very little of this educational enterprise is in the

hands of the national or Federal Government. But such is the fact. The United States Federal Government maintains only a few national institutions. These are military and naval schools, schools for Indians, Alaskans, Hawaiians, Philipinos, Samoans and the people of Guam.

Even the education of the Negroes, because they have full rights of citizenship, is in the hands of the state Governments and of the Municipalities.

A few religious sects maintain parochial schools. These are the Roman Catholics, the Jews, the Lutheran Protestants, and the Mormons. There is a certain amount of work by other organisations such as the Y. M. C. A. But it is obvious that these various special activities are utterly insignificant when compared with the enormous numbers of children who are the immediate charge of the states and the cities.

The effectiveness of this national system in reaching out into all the families, high and low alike, is seen when we look into the total figures of the census for 1912.

The total population of the United States was 96 millions, and the number of children between 5 and 18 years was 25 millions; of these the number in school is over 21 millions.

That is to say, *over 81 per cent* of the children from 5 to 18 years actually attend school. This is why only 7·7 per cent of all classes of the population are illiterate, even including the negroes (30·4 per cent illiterate) and the immigrants (12·7 per cent).

Naturally the expenditure upon these 21 millions is gigantic. Thus in the year 1912 the total expenditure on education was 482,886,793 dollars (Rs. 1,497 millions when Rs. 3·10 equals the dollar), and as the expenditure

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has increased at the rate of about 60 million dollars a year lately, the presumable expenditure at present is about 700 millions of dollars or Rs. 2,170 millions. I might mention here that the total expenditure in India in 1915-16 was about 20 millions of rupees, not one-hundredth the American total for a population at least twice as great.

While we are dealing with statistics and before turning to the closer examination we must make of the American scheme, we may note that special phases of instruction are provided in many states of the United States for the blind and the deaf and for the feeble-minded. The southern States provided instruction for upward to a million of the negro race in 1912. There are many private commercial schools, industrial and manual schools, factory schools and other special institutions which do not come within our purview.

The keystone in the educational system of the United States is this: that education is free and compulsory in all save five States for a period of about seven years for each child. The effect of this combination of forces is most vividly seen when you look at the difference between States that have compulsion and those that have not—the latter being, as I have said, only five in number. Thus, in the State of Massachusetts, every child is compelled to attend school from the age of seven to the age of fourteen, for 165 days in the year. As a result, the percentage of illiterates is two-tenths of one per cent in the population aged from ten to fourteen years. But in South Carolina, one of the five backward States, the percentage is 17·1 at the same ages. That is to say, there are 85 times as many uneducated persons between the ages of 10 and 14 in South Carolina with no compulsory law as in

Massachusetts with a good law effectively enforced. No further argument for compulsion is needed. I might here mention that the percentage of illiterates in Ceylon in the year 1911 was 73·6. Louisiana is the nearest approach to this amongst the American States, with 24·6 illiterates per cent.

It is now generally acknowledged by all statesmen and politicians that the free and compulsory system is the ideal, but governments take refuge in the plea, sometimes merely a subterfuge, that funds are insufficient. The Budget on Education exceeds everything else in importance in all civilized countries. In this connection you will doubtless be interested to know where the money comes from to pay for the education of Americans. Rural schools and higher State institutions are supported to a large extent by the income derived by the State from valuable mineral and other lands—a system most necessary where colleges and universities are concerned. But the schools in cities are almost entirely carried on by taxes levied in that city in which the money is spent. For the whole of the country in 1912 State funds and taxes amount to about 20 per cent of the income and local taxes and other sources gave about 80 per cent. This will show how very largely the Control of education along elementary lines is in the hands of the people themselves who compose any particular community.

We shall now turn our scrutiny upon certain details of the American system, so as to gain some concrete and solid knowledge of some of the more intimate phases of it. I can think of no better way than to ask you to follow with me the history of an American schoolboy. It is impossible, of course, for any one boy's life history to

embody all the possibilities, and we shall have, perhaps, to multiply our representative and send him along different lines. But let us begin by selecting a baby who is born into a town of about twenty or thirty thousand inhabitants in a middle western State, and let us suppose this baby to be a boy. The sex matters very little indeed, because the law and the force of public opinion compel parents to treat the girls with the same generosity as to education as they do boys; and education in state and city schools is mixed or co-educational from the beginning all the way through secondary or high schools and even, for the most part, through college and the university.

He is born, then, our specimen boy, in this specimen small town. Now it does not matter in the least who his parents may be, so far as the state is concerned. His father may be a common labourer, like a brick-layer or stone-mason or grave-digger, or he may be a tradesman or a doctor, or he may be a municipal councillor or the mayor of the town—he is compelled to go to school and he is asked to pay no fees. Of course much difference would be found in the families, enumerated in respect to environment. But here again the difference would be one of degree and not so much of kind. Our specimen boy is the son of an apothecary. When he is about three years old he is given, from time to time, toys to play with. Now note how education is rooted in the lives of the people. The very toys stimulate the infant mind. They will be a miniature motor car, a working model of an engine or a whole railway train, or a whole train system, with railway lines, stations, semaphore signals and the like. There will be blocks of wood or sand-stone, out of which the most splendid houses and churches are built; and also,

alas! fortresses and dungeon keeps, when the boy gets older. Some of the blocks will be coloured, and some will have big letters and numbers on the sides. The boy's mother has had, like 90 per cent of American mothers, a sound elementary and secondary education up to Matriculation level, and may very easily be a Bachelor of Arts. She will, naturally, be constantly conversing with the youngster about his toys, their colours, the names of the letters, the shapes of the blocks and a thousand and one things fitted for this three-year-old brain. When the boy is four he has a great experience. A circus comes to the town. The family goes. They see all sorts of wonderful things,—giraffes, monkeys, zebras, elephants, camels and a hundred other creatures. They see human beings who can ride standing up on splendid dappled horses. They hear bands and see clowns. And our little boy's mind is wonderfully enlarged. Afterwards his father brings home a book with coloured pictures of the things that he saw, and he picks out the names of these things, and, almost before his own parents know it, and quite without any effort on his own part, the boy has learned to read famously—but not until he has for months been talking most freely about all sorts of things. He is a living battery of questions. His mind has been enlarged with wonder and enquiry, the hunger of the mind is his pursuit in life. His games and his toys and his whole life tend to make his mind and his body alike dextrous.

When he is about six he goes to the school in his ward. His parents are anxious to send him. If they were not, the truant officers would inquire into the cause for his non-attendance; but long before this necessity arises the boy is sent in to the school. He finds himself in a large airy

room with about forty other boys and girls. They are all between five and six-and-a-half year's old. The teacher is a woman, and she is likely to be most kindly; in any case corporal punishment is mostly forbidden by law or the even greater force of public opinion.

Our boy is given a seat. It is a comfortable, polished hardwood, individual seat with a back shaped to fit his little spine; the desk is an individual locker desk; and the whole arrangement is sanitary and comfortable. Now the boy is not suddenly plunged into the mazes of spelling and arithmetic and book learning. His life here is only an extension of what has been going on at home. The idea is to play all the possible educative games. Stories are told and then the children act the story, or model a scene from it in clay. They print the names of the characters by laying coloured sticks down. They play entrancing games with coloured shells and balls and learn to count and add. The whole school room is beautiful and airy and clean and light. There are pictures on the walls, plants growing in pots and boxes in the window ledges.

There are games in which the whole class takes part, and pleasant drills and marches to music. Thus a sense of co-operation and social life is aroused. The school stands in a garden, and the most interesting things are found in the garden. Swings and see-saws and piles of sand to play in; a big open space for the finest and most exciting of running games with accompaniments of the freest shouting, and even screaming, that goes unrebuked.

On this principle our boy is led into learning. He would be a curious child indeed who did not find pleasure in schools like these.

The school year runs mostly from September to June. Then our boy is advanced to the second standard. Here his life is just as it was before, except that the proportion of book work is slightly increased. And thus he goes on for four years and comes to the end of his primary education.

What is here called a standard is called in America a grade. Our boy now enters the fourth grade. His body has been allowed to develop by play, his mind has not been stunted by forced book learning. Physical skill and dexterity have kept pace with intellectual unfoldment. Perhaps the intellectual phase has lagged behind. It is quite possible that he may be shaky and doubtful in his spelling and his arithmetic, but he is sure to be able to play baseball and basketball in a most superior manner!

His steadily enlarging curriculum has brought him an ever-enlarging outlook. His home pursuits have kept pace, and his toys now run into such things as a small electric motor, if he be mechanically inclined, or a camera, with which he will take and make his own pictures; or water-colours, or the like. His teacher is in fairly close touch with his home life, and keeps his parents informed as to what the boy does at school.

When he comes into the seventh or eighth grade his education begins to be coloured with a larger percentage of secondary subjects, but the practical and manual arts are not forgotten. He may take his second language, but does also mechanical and design-drawing and his wood-working in the manual training class. He is doing algebra, but he is also having regular hours of gymnasium games. He is studying his national history from a book, and he is also taking part in a huge annual tableau showing the history of the city in which he lives at the time

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the frontiersmen took the site from the aboriginal Indians. He learns as much by acting the part of a wild, painted, whooping Indian as by reading about the Indian, we think.

His education is saturated with patriotism, with the instinct to prize freedom, to know his own value.

In this way he finishes his second four years in the elementary school, where, with other boys and girls, under the guidance of our truly wonderful women teachers for the most part, he completes the time of attendance required of him by law. At this stage the poorer boys drop out to assist their parents by going to work, but the girls, less frequently needed as wage-earners, go on. So that, in high schools, out of a hundred pupils sixty will be girls and forty boys, on the average. Many boys, however, go to night high school.

Here, at the age of fourteen, full-fledged secondary education begins, and both men and women teachers are in charge. The curriculum is greatly enlarged, and except for a few subjects (such as English) which are compulsory, the student selects his own subjects. The high school offers him, still quite free of cost, scientific and technical courses, manual arts, classics, home economics, and scores of other lines into which he may betake himself. Each state has scores or hundreds of high schools at which free education is imparted in classical, technical, trade, agricultural and domestic economy courses. The total number of known high schools in 1912 was 13,000, or about 250 to each state.

The course is usually a four-year course, and if the student intends to go to college or university he arranges his studies, under the advice of his teachers, with this future in view. But if his education is to end with high

school, he does not prepare those subjects which are merely preliminary to College. The high school can teach him book-keeping and shorthand and typewriting; it can make him a skilled mechanic or wood-worker; it can give him courses in businesses and economics; it can teach him scientific gardening and intensive farming; it offers him instruction in many practical lines, just as it gives the girls training in domestic science and home economics, in sewing, in art, and along various special lines. Thus, even if the lad leaves school at the end of the high school period he is quite ready to enter some occupation partially fitted for that occupation.

I do not want you to think that this knowledge is merely theoretical. If a boy wants to learn journalism and printing in high school, he is attached to the staff of the high school weekly, which is edited, illustrated, composed in type, put on to the presses, printed off, bound and distributed by the students themselves. If he wants to learn business he is on the business staff of the paper, or he keeps the accounts of one of the numerous societies in the school. If a girl wants to learn cookery she assists (when she has had a little training) at the preparation of real luncheons and the like.

If our young man intends to go to college he carries on work in secondary subjects, works up his classics, or reads his history. He joins a debating society which debates living, public questions. He does not care whether the pen is mightier than the sword; he does not waste his time debating whether women are inferior to men in intellect. He meets the debating teams of other schools to thresh out matters of municipal and public moment like Government ownership of trams and railways, the

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imposition of preferential tariff and the like. He visits city and state institutions and comes to understand his duty as a responsible member of the community. If he intends to be an engineer student at college, he specializes in mathematics and science and mechanical drawing and related subjects; and he visits the city Gas Works, the Electric Power Station, the Pumping Station and the like; if a lawyer, he visits the Courts, conducts mock trials, etc.

In short, his life at this stage is immensely practical and real and commonsense. At the same time with his studies and experiments he carries on regular activities in the school gymnasium or on its games ground. The Principal of his school keeps in close touch with his parents and co-operates with them for the welfare of the boy. Regular arrangements are made for his physical examination and measurement, so that his growth and maturing shall be understood.

You can imagine what a marvellous corporate and intellectual unity a school is which has within it six or eight hundred boys and girls all between the ages of fourteen and eighteen, all divided up into four classes each one year in advance of the other. Each morning the whole school assembles in the central hall. These halls are provided with individual locker desks and seats, and for that year that individual keeps that same place. When the whole school is thus assembled, there is usually an address by public men and women when possible. Then the various classes pass out to their class-rooms; a few remain behind in the study hall if they have no work during the first period. At the end of the session the school is again assembled, and then dismissed. There are organised games and organised inter-class activities; and the

wholeschool is a constant scene of ordered, happy animation.

After this the young men and women enter colleges and universities. You must bear in mind that each of these States of the American Union has about 250 such high schools. Then you are not surprised to know that each state also maintains not one, but many colleges and universities. Thus in Illinois alone in the year 1912 there were 33 colleges and universities, 24 of them admitting both men and women. There were 596 such places of learning in all the states, which makes, according to the census of that year, at least one college or university for each 160,000 of the inhabitants. We know only too well, alas! that there is not one college in Ceylon for three or four millions of people.

There is a common and easy fling made at America that her degrees are cheap. The charge is as baseless as most generalisations are, if it is meant that our higher education is faulty. But it is absolutely true, and we admit it with pleasure, if it is meant to convey the fact that secondary and higher education in America are within the reach of the poorest. There are few countries in this world where superior education is easily obtainable by so many penniless young men of ability.

This field of the colleges is much more largely in the hands of private corporations than any other. The gifts to colleges and universities in 1912 were $24\frac{1}{2}$ millions of dollars, exclusive of all government grants. The income from state sources and fees was 56 millions. There were 230,000 men and women in the universities. Here education is not always free, but it is never very costly. The average annual fee for each individual for tuition alone is about Rs. 150, but there is considerable variation.

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The significant thing about the higher educational system in America is the wide variation in the degrees granted. In addition to such well-known degrees as Bachelor of Arts or of Science, there are the following: Bachelor of Agriculture, of Architecture, of Chemistry, of Civil Engineering, of Education, of Music, and very many others. There are higher degrees in all these and other lines. Obviously this adds very greatly to the dignity and to the extension of various professions. It is in keeping with the American doctrine, that no true labour lacks dignity; it is not a man's business which degrades him, but himself.

University education is, generally speaking, of the same kind as is found in other advanced countries. The purpose in the life of the college man or woman is not so much to study as to learn how to study. It is true that for the bachelor's degree we require four years where the Englishman may ask three. And for the master's degree we call for an extra year of real work and a thesis, where he requires only the lapse of years or that and a thesis. But the mode of carrying on is the same in principle.

The country boy has all of these advantages as well as the city boy, except that for the first four or five years his attendance at the rural school may be less regular, because of the winter snows, and except that the rural school is usually not so well equipped. But these disadvantages are offset by the healthy and open-air life that he leads and by the fact that he receives better attention in the smaller school. In these days of motor cars and inter-urban electric cars it is the exceptional father who cannot send his children to city school when they have grown to an age that is suitable.

The more obvious advantages of the education provided by the state to Americans are, then, that up to the eighth grade or standard in most states schooling is free and compulsory; it is free from that point to matriculation; and thereafter it is exceedingly cheap up to the taking of a degree. Thus the poor boy, lacking in money but often rich in ability, has opportunity. Then the fact that education is so wonderfully standardised as to materials and methods make the creation of a national spirit simple, and makes it possible for a boy or girl to transfer from one school to another without losing his position with children of his own age. And from this cause parochial and private schools are drawn into the ranks of efficiency and progress; if they are not up to the standard they lose their support from the public.

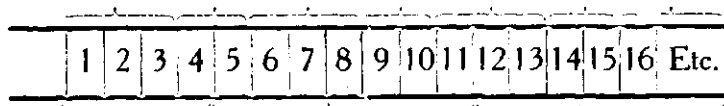
An important thing is that women are, almost exclusively, the teachers of the smaller children. And as women are less likely than men to make teaching a stepping-stone to something that pays better (for they are often teachers by choice and not necessity) the profession is given a singular stability.

Ideals of patriotism and loyalty are inculcated by the use of standard works of history. I must admit that these volumes sometimes err in that they make out all American wars and adventures to have been virtuous and noble and most American leaders to have been close upon perfection! But at least the spirit wanted is aroused. It is further strengthened by the staging of tableaux in which the school children take parts, such pageants reproducing the great episodes in American history.

In certain parts of America there is a useful scheme in vogue to deal with the difficult problems of the laggard

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and the genius. The ordinary procedure with the bright child is to let him skip a grade or standard, and with the laggard to keep him two years in the same class. This policy is gravely at fault, since it drops a precious unit out of the knowledge of the one child, and stultifies the other; and in both instances an element of discordance is introduced into the class in which the bright girl or boy or the laggard sits. This diagram shows how the problem is solved. Suppose the curriculum of the eight years of school to be divided into twenty-four parts, that is, each year to have three terms. The first year then is represented by



squares 1, 2 and 3; the second by 4, 5 and 6, and so on. The normal child takes in the first year the first three units of the curriculum. Next year he takes three more, and so on. The procedure of the laggard is shown by the upper brackets and the history of the unusually capable students is shown by the lower brackets. The scheme is varied in many ways to suit the individual.

Naturally, to supply the need for teachers of ability, the state spends lavishly upon training schools. These Normal Schools, as they are called, stand at the level of universities and colleges, and frequently send students over to the colleges, thus keeping the teacher to be in touch with the world's advance in other lines than his own department of pedagogy.

There is, in all this lavish expenditure, great room, in the nature of the case, for progressive practice. Thus my own University, in one or two of its departments, uses the kinema. The Extension Department makes a

speciality of showing farmers throughout the state how to irrigate most economically, how to clear land, what are good methods of sowing, reaping and the like. Besides using progressive methods themselves the teachers encourage inventiveness in the pupils. Originality and the inquiring mind are treasured in America.

Finally, in reviewing the more obvious advantages, it is clear that one of the greatest advances in America is the putting of examinations in their rightful place. Instead of straining the memory and burdening the mind we hold that the sound advance in the class-room and laboratory and field are the measure of the able student. We think that his teachers must know him better than strange and often arbitrary examiners.

The chief limitations in the American system may be mentioned here by way of contrast. It is traditional there that technical or theological forms of religion shall not be taught in state schools. There is a certain lack of that cultural touch which comes to students in the best of boarding schools. And it would seem (though I am not sure how far this is a limitation) that the study of the classical languages is declining. There are numerous other weaknesses in the system, but that side of the subject need not engage us here.

There are three specialities that are now appearing in America. We are developing the rural school as the heart-centre of the country district. A fine set of buildings, a model farm, a good library and like advantages are given, not only to the farmer's children but to the farmer himself. In some rural schools a special effort is made to reach intimately into the family lives of the children and to better them. To this end the teacher gives credit in the

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school for things done well outside school, when reported on a form like this:

HOME WORK RECORD OF

For week ending19.....

Sun. Mon. Tue. Wed. Thu. Fri. Sat. Total.

- 1. Work in garden
- 2. Splitting kindlings
- 3. Bringing in fuel
- 4. Milking cow
- 5. Care of horse
- 6. Preparing meals
- 7. Washing dishes
- 8. Sweeping
- 9. Dusting
- 10. Bedroom work
- 11. Washing
- 12. Ironing
- 13. Care of baby

- A. Bathing
- B. Brushing teeth
- C. Sleeping with open windows
- D. Going to bed before 9 o'clock
- E. Attending church or Sunday school

Total

I certify that the above is a correct record

Signature of parent or guardian.

In the city the tendency is toward the vocationalisation of education—a fine mouth-filling phrase! The thing itself is filling a need in the national evolution, and more and more states are organising their schools on the vocational basis. As parts of these movements the Universities reach out, with their Extension Departments, into the little and big towns and even into the villages, in such states as Wisconsin. “Anybody can learn anything” (in the popular phrase), from his own State University. Sets of illustrated correspondence, instruction sheets and books, travelling lecturers, who carry exhibits and lantern pictures with them, and many modern devices are used to carry enlightenment and modernity to the door of every man’s house. The whole system is built on the policy that the universities and the schools are the property of the people and that their work must be given to the people as cheaply as possible.

When we turn to Ceylon (where, since I have been working for three years in the educational field, I have a special interest) we see how marked is the contrast. In expenditure for education there is a vicious circle. The people are too poor to pay for good education; they are too ignorant to earn more; so they remain too poor to pay for good education; and so they remain too ignorant to earn more—and so on continuously. The insufficiency of the system here is strikingly shown by statistics. I will set before you comparative figures from America and Ceylon, in the former for the year 1912 and in the latter for 1915, in each case the latest I have. We give Ceylon the benefit of three years’ handicap in the race.

In 1912 the percentage of the population enrolled in elementary schools in the U. S. A. was 19.03. In

Ceylon in 1915 the percentage was apparently 8.40.* In 1915 in Ceylon the expenditure per head of each child on all the school rolls was Rs. 5.48, while in the U. S. A. for 1912 it was Rs. 112.53. In another way the difference is seen more strikingly. If we divide the total expenditure on education by the total population, we get the expenditure per head of population. In Ceylon for 1915 this was 50 cts; in America in 1912 for elementary schools only Rs. 15.65. Finally, compare Colombo with a city of the same size in America, say Evansville, Indiana. In Colombo there are said to be 12,000 children of school-going age growing up ignorant to swell the criminal classes, though the tax rate is 18%. In Evansville the rate is only a third of a per cent, and every child is educated free up to matriculation.

I have found some rather striking figures in the Report of the Commissioner of Education of the United States for the year 1913. The statistics which follow are for elementary education only for the years 1910, 1911 and 1912, varying with the country. The tabulation will repay study, especially by comparing Switzerland with Ceylon, as they have almost the same population. The name of the country, its total population at the last preceding census, the number of children in school, the percentage of population in school, the amount expended per head of children in school and per head of population are given. The order of countries is made according to the amount spent per head of children in school.

* In 1911-12, 10.01 p. c.

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Country	Total Population	Children in School	Per Cent in School	Expended per Capita	
				on Roll	of Pop.
				Rs.	Rs.
U. S. A.	95,545,336	18,182,937	19'03	76'91	15'65
Scotland	4,760,904	844,715	17'74	75'14	13'33
Switzerland	3,741,971	538,286	14'38	62'32	9'23
England & Wales	36,070,492	6,075,497	16'84	59'79	10'04
Ireland	4,374,584	707,280	16'16	35'49	5'73
Belgium	7,490,411	934,830	12'50	26'00	3'25
Spain	19,588,685	2,052,158	10'40	9'20	'96
Ceylon	3,592,397	359,657	10'01	4'58	'43
British India	244,708,413	4,627,706	1'89	4'18	'06

* This column is to be considered with care. In some countries (Ceylon is one of them) there is a large enrolment as compared with actual attendance. In America children are compelled to attend, not only to be enrolled.

The weakness of the system here is due to two fundamental mistakes:—

- (1) Education is farmed out to people and bodies whose first interest is often something other than education, or who are mere amateurs, or money-makers.

- (2) There is no policy and hence no adequate expenditure. Not a twenty-fifth of the revenue of Government goes to education, when it is well known that this department holds in its hands the future welfare of Ceylon.

The objection is raised that the religious differences prevent Government from taking over education. This is without foundation, as there are already many Government schools. Besides, most of the children in "Christian" schools are non-Christians! It is said that Government must be neutral in religion. Even if it were, this would merely mean impartiality. The Burma system, wherein each boy is taught his own religion in Government and grant-in-aid schools, can be followed. Japan finds no difficulty, nor Mysore. It is only by teaching the great religions side by side that the bigotry and intolerance which fracture Ceylon's social structure can be eliminated.

The more formidable objection is that there is no money. But this also is the result of a wrong view. Nothing is more important than education. It is clear that this objection is merely fictitious when you look at Colombo, with its enormous taxes and its 12,000 uneducated children of school-going age.

What is wanted is a broad and intelligible programme for the future. We have trained the destructive and critical mind, imitation and memory; and the body a very little. Our system is toward "large learning and small sense." We need a system that will pay more attention to the body, inculcate the idea of the nobility of work. We want a system that will develop and train the emotions, but not through fear; that will rouse the whole mind—*invention and construction, wisdom and freedom from restrictive*

bad customs; that will produce tolerance and co-operation; that will rouse the compassion and patriotism of the youth so that they may take their right place in their Empire. There are grave faults in Ceylon's social organisations. These can be found out, and studied, and, to some extent, alleviated by the Ceylon Social Service League and other charitable and reform bodies, if they receive (as they should) your hearty real support. But for a radical and lasting cure and prevention of these evils there is one prescription and one only, and that sole sovereign remedy is:

STATE EDUCATION.

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PRINCIPLES OF EDUCATION

WITH A SCHEME APPLYING THEM TO NATIONAL EDUCATION IN INDIA

Dedicated to Parents, Guardians and Teachers

BY

ANNIE BESANT

*Chairman of the Executive Committee,
Board of National Education*

THE SOCIETY FOR THE PROMOTION OF NATIONAL EDUCATION
MADRAS. S., 1918.

This publication is issued under the authority of the Board of National Education as a useful contribution to educational work in the country. Neither the Board as a whole, nor the Society, nor any individual member, is to be considered as necessarily agreeing with every view expressed in publications approved of by the Board as useful.

GEORGE S. ARUNDALE,

Registrar.

January, 1918.

PRINCIPLES OF EDUCATION

The principles of Education, its natural bases in the human constitution, are permanent, while their applications must be local, adapted to the conditions of time and place. Hence while the Natural Law of Education must be recognised, there should be freedom in experiment and flexibility in application, so that we may discover the best methods available to us for the moment, and use them until we find better ones. By following the Natural Law, we shall facilitate the evolution of the child into the adult, working with Nature not against her; that is, Education will be recognised as a science, and not a haphazard dragging up of youth, consisting chiefly in forcing into them knowledge from outside, instead of helping them to unfold and utilise the capacities they have brought with them into the world. As Happiness increases the life-forces and Pain diminishes them, as Love energises and inspires to Right Action, while Fear paralyses faculty and inspires Hate, Happiness and Love should be the atmosphere inbreathed by the young, whether in the Home, the School, or the College.

As man is a spiritual being, manifesting in the external world as Intelligence, Emotion and Activity, the Education of the young must help the inspiring Life to unfold itself, and must train the organs of Intelligence, Emotion and Activity; that is, must be religious, mental, moral, and physical. Any so-called education which omits any one of these four departments of human nature is imperfect and unscientific, and its outcome will be a human being deficient in one or more of the groups of capacities on the balanced evolution of which the extent of his usefulness to Society depends.

But the introduction of the word "Society," reminds us that Education is not the training of an isolated individual, but of an individual living within a social order, the happiness of which depends on the recognition by each that he is not an isolated but an interdependent being. Society is a congeries

of interdependent individuals, every one of whom has his place and his functions, and on his due discharge of the latter the right working of the whole depends. Hence Education must consider the youth as the embryonic citizen, with social duties and social responsibilities, must see him in relation to his environment—the Home, the School, the College—and from his earliest years must train him, as boy or girl, to feel himself as a part of his country, with his duties and responsibilities to the Motherland; that is, he learns to serve the Motherland in the Home, the School, the College, as a foundation of, and as a preparation for—not as apart from—the wider and fuller service, as man or woman, in the larger world. We must evoke the sense of duty, by showing the pupil that duty is a debt he owes, first to the parents, the brothers and sisters, the servants, who have protected him in his helplessness, have surrounded him with affection, and on whom his nurture and happiness still depend. We must evoke the sense of responsibility by showing him how his thoughts, feelings and actions affect his environment, and then react on himself. Needless to say we do not teach these principles to the child, but they must be understood and practised by parents and teachers, so that they may base their education of the child on knowledge, and vitalise it by example.

This duality, the evolving life and its environment, must be borne in mind throughout education, as its subject matter will be distributed under these two heads.

The first includes the evolution of the individual *quâ* individual, the drawing out of all he has in him, thus raising him in the scale of evolution. The second is that which the old Greeks called Politics, a word which has been narrowed down in a most illegitimate fashion in our modern days to the strifes of political parties, a degradation of a noble word which used to include all the relations of a man to his environment; in that older sense we shall use it here, in order that the unity of the relation of man to his environment may be realised—the unfolding consciousness recognising, and therefore becoming related to, a larger and larger environment, the Home, the School, the College, the City, the Province, the State, the Race, Humanity, the World. There is no break in principle; the first three are a preparatory stage for the second three, and this whole six for the remaining three; the infant, the youth, the young man is the

embryonic citizen, to be born into the outer world truly, but shaped and nourished in the womb of the mother, himself all through.

Let us first consider the objects of each department of education.

OBJECTS

Religious Education.—The object is to clear away the obstacles which hinder the natural instincts of the unfolding Life—Love to God (Life-Side) and Service of Man (Politics-Side). These obstacles are summed up in the idea of separateness, the essence of spirituality being Unity.

Mental Education.—The object is to develop and train the powers of Intelligence as an aspect of the evolving Life. On its Life-Side it develops and trains those powers, such as observation, memory, co-ordination, reasoning, judgment, the clarity of thought and its lucid expression. Its Politics-Side is a knowledge of the evolution of Society to its present condition, and a clear vision of the next stage of its progress.

Moral Education.—The object is to develop and train the powers of Emotion as an aspect of the evolving Life. Morality is "the science of harmonious relations," and on its Life-Side it is Truth, harmony between the smaller and the larger Self in Will, Emotion and Action, showing itself in the virtues of accuracy and honesty in intellectual matters, and in the effort to realise the ideal intellectually chosen. On its Politics-Side, it is Love, and includes all the social virtues, the sense of duty and responsibility.

Physical Education.—The object is to develop, train and co-ordinate the nervous, muscular and glandular elements into digestive, respiratory, circulatory, reproductive and nervous systems, with their special organs of action as an aspect of the evolving Life. The Life-Side is to provide a sound and well-balanced and well-controlled body, as the physical basis for religious, mental and moral activities. All of these are conditioned by the physical body, are distorted, or rendered excessive or deficient, by physical disturbances, mal-co-ordination, excess or deficiency of physical vitality. The Politics-Side is the use of this for service in such of the nine stages above-mentioned as are embraced in the individual consciousness.

NATURAL FACTS

The early evolution of the human being falls into three natural periods of seven years each, ending at the ages of 7, 14 and 21. Pupilage and Studentship ought to cover these, and at 21 the young man and woman should be fit to face and profit by the Education of the outer world.

First Period, Birth 1 to 7.—Chiefly Physical. The Senses predominate, and the passions are stimulated chiefly by the contact of the sense-organs with external objects; hence the Education should train the senses by accurate observation of natural objects and of the happening of definite sequences, leading later to the evolution of the reasoning faculties, for the training of which the brain has not yet developed—but is preparing—the necessary physical basis. The greatest possible freedom should be given to the child, consistent with protection from serious injury to himself or others, so that he may show his natural capacities, and they may be drawn out by opportunities provided for them. The passions, hardly yet to be called emotions, must be gently trained. The nutrition of the body is all-important, as serious errors in this vitiate and shorten the whole future life.

Second Period, 7 to 14.—Chiefly Emotional. The Emotions predominate, and the mental faculties are excessively coloured by them; hence the Education should be directed chiefly to their training and control, so that when the period of puberty arrives the boy and girl may understand the broad facts of human physiology, and may have gained a mental control of the emotions. The reasoning faculties are germinal and should be developed but not overstrained, the mental education being mainly the accumulation of facts, gained by observation and experiment, and the training of the memory by their co-ordination, the acquiring of languages, formulæ, and the like—studies which depend largely on memory.

Third Period, 14 to 21.—Chiefly Mental. The mind, accustomed to observe and well-stored with facts, has the materials of knowledge. It is now to work upon them. This is the period for the developing and training of the reasoning faculties of co-ordination, of judgment, passing to the serious study of Logic, Philosophy, Science and Art.

A GENERAL SCHEME
FOR
NATIONAL EDUCATION IN INDIA

GENERAL SCHEME

In all schools the medium of instruction will be the Mother-tongue of the District. English will be taught as a second language throughout the Secondary and High Schools. The hours at school should be from 7 A.M. to 6 P.M. Tuition 7 to 10 and 2 to 4. Food, Rest and Games 10 to 2 and 4 to 6. (The hours will vary in different parts of India. The principle is to have rest, not brain-work, after the chief morning meal.)

The day's work should begin and end with a short religious service with singing.

School Education is divided into *Primary*, class I, A and B, ages 5—7. *Lower Secondary*, classes II, III and IV, ages 7—10. *Higher Secondary*, classes V, VI, VII and VIII, ages 10—14. *High*, classes IX and X, ages 14—16. The *Higher Secondary* will be closed by an examination, and from this point boys entering on crafts and industries should pass into Technical Schools. The *High* will also be closed by a School-Leaving examination. Those who enter professions such as engineering, the higher grades of agriculture and of business and commerce, teaching, arts, science, medicine, etc., will pass an additional year in a University Preparation Class, whence they enter a College by passing an Entrance Examination, taking their degree in three years, i.e., at 20 years of age, and entering on post-graduate studies thereafter.

Girls' Education will be the same as that of boys in the Primary and Secondary stages, except that needlework, music and cookery will form a part of the Manual Training in the Secondary stages, and in the Higher Secondary, household economy, hygiene, home science and first aid will take part of the time devoted to literature, history and geography by those who intend to pass into High Schools. So many girls leave school at 12 and 14 years of age that it is necessary at present to make these modifications. Thus we have:

PERIODS

1. Birth to end of 7th year (English, 7th birthday).—*Primary Education.*

(a) Birth to end of 5th year—Home.

(b) Sixth and seventh years—Primary School.

2. 7th to end of 14th year (14th birthday).—*Secondary Education.*

A sound general education, without specialisation, closed by a certificate examination. The education should be a judicious balance between theoretical and practical instruction.

3. 14th to end of 21st year (21st birthday) or beyond.—*Higher Education.*

(This branches out into three sub-periods according to the future chosen by or for the student.)

(i) 15th to end of 16th year (16th birthday) High Schools, either completing the School Course, or leading to the University, of various types:

(a) Ordinary High Schools, including a practical department, and offering various alternative subjects according to the career chosen by the student.

(b) Technical High Schools, including Schools of agriculture, trade, business, etc.

Both closed by a school-leaving certificate examination.

Students passing on to the University do not go up for this examination but take a further year, with the examination at its close.

(ii) 17th year, in a preparatory class for admission to the University, at the end of which there is an entrance examination.

(iii) 18th to end of 20th year—the University, including business, agricultural, teaching, science, arts, engineering and other departments in appropriate Colleges.

Closed by degree examinations, and leading to post-graduate studies.

GENERAL OUTLINE OF STUDIES

[*Parents and Teachers should acquaint themselves with the systems of Froebel, Pestalozzi and Montessori, and the investigations of Binet.*]

FIRST PERIOD, CHIEFLY PHYSICAL

HOME. Life-Side. The care of the body must dominate all **YEARS 1—5** other considerations, and for the poor and neglected, pre- and post-natal clinics are essential. From birth, regularity of habits should be formed, and the infant should be carefully watched, but not be constantly in the arms or lap. He should be left to crawl about and surrounded at a little distance with brightly coloured or shining objects, awakening curiosity and exertion to reach them. He should not be put on his feet nor helped to walk; his own efforts are best and safest. At about 3, increased opportunities of choice should be put in his way, to draw out his faculties and aid originality. He should be encouraged to observe and to make his own little experiments. He should learn to know the parts of his own body, arms, legs, hands, feet, eyes, ears, nose, mouth; should count his fingers and toes, to his own great amusement.

At 4, his play may be a little organised, but the organisation must never be forced on him, but rather offered when he feels a want, and begins to grope for its satisfaction. Above all, a little child must never be harshly spoken to, nor frightened. Fear breeds deceit, because of the helplessness of the child, surrounded by people bigger and stronger than himself. The great virtue of Truth will be naturally evolved in the absence of fear. Little outbreaks of temper should be met by catching the attention with some pleasant object.

Politics-Side. Home Politics is the evocation of the love instinct, and the gentle direction of it to find pleasure in sharing, and pain in holding for itself alone. Every movement of the child to *give* should be met with smiles and caresses, while grasping as against another should result in sadness of look. The play of children together should be used to help them to feel their interdependence, the happiness of harmonious relations and the pain of discord. The opportunity for doing

little services should be given, and the child encouraged to help all around it, to be kind to animals, plants, etc., to be clean, neat and orderly, because these habits make the home pleasant for everybody.

PRIMARY SCHOOL. Class I, A and B. Life-Side. Play is the method of teaching, largely based on the observation of objects, and on their inter-relations, their number, their shape, their colour, their use. Dexterity of finger should be developed by the making of objects. The school-room should be scattered over with attractive objects, which stimulate curiosity and desire to imitate, and thus evoke the creative power of dawning intelligence and shaping touch. The child should wander about freely, and choose for himself the objects which attract him. The teacher should watch him, should help him only when larger effort begins to be discouraged by failure. The child will learn largely by imitation. He will learn exactitude by discovering that badly made things won't work. He will learn that success waits on obedience to conditions, and that impatience, anger, petulance, do not change the nature of things but only ensure failure. Reading and writing will be learned by play, if the opportunity be given as soon as the child wants to do either. It has been found by experience that if a child is given cut-out written letters to play with, and is guided to trace them with his finger many times, the desire to imitate awakens, and he asks for paper and pencil and repeats the motions so often made, thus producing the letters; he teaches himself to write. Reading may begin with short nouns accompanied by pictures, the word being pronounced by the teacher and thus associated with the picture. If the word and its picture are on a block, the blocks may, after a time, be jumbled together and the child picks out any word named.

Stories should be used as means of teaching religious and moral lessons, and class singing of stotras and bhajans. It is very desirable that each school should have one or more shrines according to the faiths of the pupils, where the children could go as a part of their religious education, and be trained in their own forms of devotion. Drawing and modelling should be encouraged. The four rules of simple arithmetic should be taught by objects.

Politics-Side.—Primary School Politics are only an extension of Home Politics, of usefulness and helpfulness, now showing these to people who are at first strangers. The circle of service is enlarged. The child should put away neatly in their own places all the objects he has used, that others and himself may find them easily next day. He should clear away any rubbish he has made, and help to leave the room neat and clean.

The school should have a compound for games, exercises, dancing and class movements with descriptive songs. All these help the child to see and feel that co-operation and harmony make the exercises pleasant to all, while the absence of these in any spoils them for all. Little gardens should be given to the children, and they should be led to observe birds, insects and flowers.

The child will, unconsciously, practise in the home the ways learned in the school, school and home thus reacting on each other.

Great care must be taken not to tire the child, to see that he is properly nourished, that he develops no bad habits, and, remembering his imitativeness, his teachers should be chosen with scrupulous attention to their manners, accent, and general refinement and gentleness. During these years and during the second period, the child is chiefly receptive, and his whole life is strongly influenced by his surroundings. Character appears and tendencies are developed. No later efforts can wholly eradicate impressions made during these plastic periods.

SECOND PERIOD, CHIEFLY EMOTIONAL

YEARS 7 TO 10 LOWER SECONDARY SCHOOL. *Classes II, III, IV.*

Religious Education.

Life-Side.—The idea of God as a loving Father, who has shared His Life with us and with all things. Stories, stotras and bhajans.

Politics-Side.—This sharing of life as a reason for helping all around us, shown by stories taken from the lives of great religious Teachers and philanthropists.

Intellectual Education.

Life-Side.—A good foundation for knowledge of the Mother-Tongue, by reading, composition (story-telling by teacher

and reproduction by paper, observations of simple objects, etc.). Sanskrit, Pali, or Arabic, very elementary. The classical languages of India, Sanskrit, Pali, Arabic, should be taught (as English now) from the standpoint of such modern teaching methods as Berlitz, Gouin and similar methods. No declensions and rules should be taught at first. The child should first learn the names of the objects which surround him, then simple phrases concerning the life which he actually lives among these objects, leading on to simple conversation. Only after real interest is aroused in the language as a *spoken* language should rules of grammar be begun. English, by conversation, and telling easy stories. Nature-study, such as life-history of plant and animal, observations and experiments. History and geography, by pictures of places in India and stories about them, the making of models and maps, beginning with school compound, immediate surroundings of houses, roads, fields, etc. Arithmetic, easy problems, Indian money, weights and measures, simple bills, simple geometry and measuring. Pictures and models to be plentifully used, and to be carefully chosen to develop the sense of form and colour, and the appreciation of beauty.

Politics-Side.—Constant reference during teaching to the interdependence shown in common languages, history and geography. Duty to those nearest to us as service of Motherland.

Moral Education.

Life-Side.—Stories, illustrating truth, devotion, courage, honour, fortitude, etc.

Politics-Side.—Laying stress on all around us as our larger family, with stories of self-sacrifice, of duties to elders, equals, and youngers, of kindness to animals and plants. Inculcation of duty of service by examples of it, and of love and pride in country by stories illustrating these from Indians great in literature, art, science, wars, and social service.

Physical Education.

Life-Side.—Care of bodily cleanliness; value of healthy body; self-control; orderliness; reaction of anger, jealousy and other passions on health. Drawing and modelling. Gymnastic exercises. Breathing, elementary manual training.

Politics-Side.—Concerted exercises with music; drill; games wherein co-operation is necessary to success. Duty and pleasure of using knowledge and skill to help the more ignorant and clumsy.

YEARS 10—14 HIGHER SECONDARY SCHOOL. *Classes V, VI, VII, VIII.*

Religious Education.

Life-Side.—Outline, illustrated by stories, of the chief doctrines of the pupil's religion.

Politics-Side.—The fundamental unity of religions. Sufferings caused by intolerance and bigotry.

Intellectual Education.

Life-Side.—More advanced teaching of Mother-Tongue, literary and colloquial. Samskrit, Pali, or Arabic. English, by reading of simple modern stories with plenty of dialogue, letter-writing, copying extracts of good modern authors. Nature-study, including anatomy and physiology of human body, dissection of plants, and their growth. Physical geography, including elementary physics and chemistry. Indian history and historical geography, including preliminary outline of Indian political, economic and industrial geography. Indian life in different periods of history such as Chandragupta I and II, Mughal, etc. Outlines of the geography of the world. Higher Arithmetic. Elementary Algebra and Geometry.

Politics-Side.—Here, again, the unity of the Nation under superficial differences must be the spirit of the intellectual instruction. Stress should be laid on the political, economic and industrial conditions. Pupils in these classes should learn to help and teach those in the lower classes.

Moral Education.

Life-Side.—Fuller teaching on the virtues needed to make the good man, and

Politics-Side.—The good citizen. Civics and Aesthetics will be introduced.

Physical Education.

Life-Side.—Instruction in the physiology of sex—plant, animal, human. The individual and national need of

Brahmacharya in student life. Danger of errors in the great transition from boyhood to manhood. The body to be trained in muscular strength, hardness, and athletics, before the danger-zone is entered. Indian exercises to be practised daily. Carpentry, basket-work and the use of tools to be practised. First Aid to be taught.

Politics-Side.—Continuation of Lower Secondary. Duty to the Motherland of making and keeping vigorous health. The self-control of true manliness. The training of the playground in co-operation, discipline, obedience and the leadership of merit all-important.

THIRD PERIOD, CHIEFLY MENTAL

Years 14—16. High School. *Classes IX, X.*

Religious Education.

Life-Side.—Fuller teaching on chief doctrines of the pupil's religion.

Politics-Side.—Mutual respect among religions. The special value of each of the great religions. Their relation to each other in India.

Mental Education.

The type of education during these two years of school life will to some extent depend upon the after career the pupil is expected to adopt. There will be a certain specialisation, in the sense that boys studying in different High Schools will study different subjects according to the careers for which the High School is a preparation. On the other hand, certain subjects will be common to all High Schools.

Life-Side.—Common Subjects; Further instruction in the Mother-Tongue. English, by composition, reading of suitable classical prose writers, e.g., Ruskin, and poets, and including readiness of expression in reading and writing. General science, including further physics and chemistry, applied physical geography, further anatomy and physiology of human body, with more detailed instruction in First Aid. Further Indian history and historical geography. Further algebra and geometry. A short course in elementary psychology.

Special Subjects to be included in the curricula of

(1) AN ORDINARY HIGH SCHOOL

(a) *Arts Division*.—Sanskrit, Arabic or Pali. A more specialised course in (a) Mother-Tongue, (b) English, (c) Indian history and historical geography. History of the British Empire.

(b) *Science Division*.—Sanskrit, Arabic or Pali. A more specialised course in (a) Mother-Tongue, (b) English, (c) Physics, Chemistry, etc., (d) Algebra and Geometry, including Trigonometry and Mensuration, with the elements of Surveying. Further Nature Study.

(c) *Teachers' Division*.—Pedagogy, further Psychology, School Management. A course in the principles of Physical Training. Domestic Science. Where possible, practice in Teaching. Further Nature Study.

(2) A COMMERCIAL HIGH SCHOOL

Commercially useful foreign languages, business forms, book-keeping, commercial arithmetic, office methods, commercial law, type-writing and shorthand, commercial history and geography.

For girls, food supplies and cooking.

(3) A TECHNICAL HIGH SCHOOL

Same as in Science Division of an Ordinary High School, omitting Sanskrit, Arabic or Pali, and adding: (a) Industrial history, (b) Elementary Engineering, (c) Mechanics, (d) Electricity.

(4) AN AGRICULTURAL HIGH SCHOOL

All subjects to be taught with special reference to their bearing upon rural daily life. Mathematics, including book-keeping, land surveying and mensuration. Experimental Science (Physics and Chemistry) with special reference to Agriculture (boys), domestic science (girls). Elements of mechanics, with special reference to agricultural machines. Nature Study and gardening. Elements of sanitation and engineering.

The above courses indicate in outline the kind of education suggested. But other types of High Schools might also be useful, e.g., Art High School, for music, drawing, painting, etc.

Politics-Side.—The various subjects should not only be taught from the point of view of their value to the individual, but equally with reference to their constructive value as regards the growth of the Nation. The elements of Social Science should be understood in outline.

Moral Education.

Life-Side.—Further training in æsthetic development, including artistic appreciation.

Politics-Side.—The encouragement of the chivalrous spirit. Elder boys who show signs of the true political spirit should be appointed monitors and prefects.

Physical Education.

Life-Side.—Manual training, shop practice and laboratory work constitute the physical side in the case of scientific and related subjects. Continuation of the instruction under this head as given in earlier years.

Politics-Side.—A fuller understanding and practice of the work in the Secondary stage. Parliaments, Debating Societies, Social Service Leagues, Night Schools, etc., are invaluable media for the expression of student-citizenship. Emphasis should be laid on the value to the community and Nation of the special profession for which the student is preparing. The teacher will continually lay stress on the essential dignity of all true labour, of whatever kind.

THE SEVENTEENTH YEAR. Special preparatory class for College careers.

Attached to each High School there will be a preparatory class for students proceeding to the University. The University will comprise all types of colleges—business, agricultural, arts, science, teachers' training, etc.—and in the various preparatory classes the students will be grounded in such special knowledge as may be required to be known before they begin the three years' College course. These special classes lead to an Entrance Examination to be conducted jointly by the University authorities and selected members of the various school staffs.

SCHOOL AND COLLEGE POLITICS

It will be seen that School Politics should form a natural daily part of the school life, consisting in co-operation and in

all forms of service. The students in the High Schools should learn to take interest in the life of the poor of the town, and should be trained to give help in festivals, in town and village accidents, and in the teaching in the primary and night-schools. They should be encouraged to seek and utilise opportunities of service, and learn to see in all service of the poor, the suffering, and the younger, the Service of the Motherland, and to use these also as the training for higher Service by practice and by the gaining of knowledge.

Boys at School should be encouraged to join the Indian Boy Scouts Association; at College, Cadet Corps should be formed for regular drill.

In the College, they should continue in the path of Service, and should also attend public lectures: on sanitation and kindred topics touching the health of the people, on social reforms, legislative problems, on the condition of the masses and how to help them, on the questions with which they will have to deal when they leave the College for the wider life of men. Equipment for public life must be largely gained in pre-graduate and post-graduate studies, for to rush into action unprepared and unequipped is folly.

VILLAGE DEPARTMENT

Schools in small villages need to be arranged in a fashion somewhat different from those which are intended to send their pupils on into Secondary and High Schools. The Village School is usually all the School the boys and girls enjoy, save in the exceptional cases of brilliant pupils.

The day's work should begin with the singing of a bhajan by the children, and a short prayer. Reading as before explained, and writing, the lessons very short, with drill, dances or games between them. Simple arithmetic, as before, by objects. A lesson on flowers, leaves, grains, seeds, animals, brought by the children, to be chatted over. Geography by a map of the village in damp sand, fields, houses, well, tank, temple, and the paths and roads leading away to other places. Gardens, how to prepare the soil, to sow, to weed, to water, to train plants. On wet days the making of baskets, learning to sew, to knot, to drive in a nail, a screw, to mend utensils, etc.

At 8 or 9 years of age, half the school-time should be spent in the working sheds attached to the school, where the village trades should be taught. The gardens lead up to agriculture, to be taught in land set apart; in the school, the growth of the plant, why it drains the soil, and how to make the loss good; in the field, examples of plants in manured and exhausted soil. How to dig deeply, to graft, to prune. The care of animals, and kindness to them, will be part of the training. The carpenter's shed takes some of the boys, and they learn to make tools and simple articles used in the village. Others to the weaving shed, learning the use of simple improvements that increase output.

Both boys and girls from about 10 should learn how to bind up a cut, where and how to put on a ligature to check dangerous bleeding, how to bandage a sprained wrist and ankle, how to make and apply a poultice, what to do in cases of the bite of a dog, horse or snake, the sting of a scorpion, hornet or wasp, a bad scratch, a burn. The need of scrupulous cleanliness in all dressing of wounds.

Sanitation, domestic hygiene, cookery, washing, house-cleaning, should be learned and practised by the girls, while the boys are in the work-sheds.

The teachers should mark any pupil with special gifts, that he or she may go on to a secondary school, but the large bulk will have all their schooling in the village, and the instruction should aim at making the village life interesting. The school-house should form, in the evening, the village club, and lectures might be given to help the adults, often eager to learn.

It is suggested that these village schools should form a separate department of the Board's work. Boys in the High School of a neighbouring town should be induced to help the villagers and their children as a way of serving the Motherland. For instance, round Madanapalle six Village Schools are growing up, built and managed by the boys.

NOTES ON SECONDARY EDUCATION

By G. S. ABUNDALE, M.A., LL.B.

The following subjects are to be studied during this period, some being taken up later and others from the beginning.

Religion.—From the standpoint of the individual, religious instruction should acquaint the pupil with the lives of great spiritual teachers and with his duty to reverence them according to their advice and example. By means of stories the virtues of devotion, kindness, etc., should be strengthened. The details of ceremonial and other aspects of religion do not come within the province of the secondary school. Religion must also be taught as a unifying force and therefore as a motive for social service, through the example of the great spiritual teachers, all of whom lived and worked for others.

Physical Instruction.—The purpose of physical instruction is to enable the pupil to build a healthy body, by means of exercises and games, so that the body may be a servant and not a master. The purpose and value of a healthy and well-controlled body should be clearly explained, and theoretical study should lead up to the elements of physiology and hygiene. Singing might usefully be included under this head. Pupils should be trained to realise the value of a healthy body as an essential factor in success and happiness in life, and the teacher should study the value of rhythmic exercises as aids to self-control.

Politics.—The pupil should begin to learn that he is a member of the social order, depending upon it for his well-being, and sharing with others the common heritage of the past. The beginnings of the conscious realisation of his membership in the community will be gained when the child first goes to school, and this later period is a connecting link between the home and the wider surroundings, with which he will later on come into contact.

Individually, the study of politics removes selfishness and narrow interests from dominating motive; while, socially, the study of politics shows him how to become an intelligent and responsible member of the community in its varying aspects—i.e., home, school, college, village, town, province, Nation, etc.

Nature Study and Science.—The basic value of Nature Study and later on of more formal sciences is (1) to enable the pupil to understand the life around him, and his relation to it, through observation and experiment; (2) to co-operate with Nature intelligently, so that the various kingdoms of Nature may live and grow harmoniously together. By the study of

Nature the pupil learns also to appreciate growth *qui* growth, and gains a sense of the majesty and grandeur of life. He learns to realise the essential unity of life and of his part in the mighty whole.

One of the special values of Nature Study is that the pupil becomes encouraged to emulate the observed inventiveness, resourcefulness and adaptability of Nature.

From about eleven years of age the pupil may take up physiography, including the necessary experimental physics and chemistry. These studies should also arouse in the pupil a sense of the value of industry in human life and in the dignity of productive work.

Indian History and Geography.—First in the form of stories, and gradually leading to local history, with excursions. Preliminary outline of Indian political, economic and industrial geography. A study of Indian life at different periods of history, and under the varying geographical and other conditions of modern life. Outlines of the elementary geography of the world. Indian history should be taught so that it gives the student a full sense of the value and dignity of the National characteristics, and awakens a pride in the history of the country's past.

Each Province might be allowed to lay stress on its own provincial history.

Mother-Tongue.—Apart from the need of all subjects being taught in the pupil's own Mother-Tongue, efforts should be made to lay the foundations of a good knowledge of the Mother-Tongue, both from the literary standpoint and from the point of view of the language as a medium for the expression and communication of thought. Careful study of the Mother-Tongue influences refinement of speech and accuracy of expression.

English.—Con conversationally from eight years of age, and more definite study during the last three years of secondary education. The object of the study of English is not merely to facilitate intercourse, trade, etc., but to introduce the Indian pupil to the spirit of the English race, so that the useful elements in the growth of the English-speaking peoples may be assimilated in the life of India.

Mathematics.—Practical geometry from the age of seven years, as also arithmetic. The object of the study of mathematics is partly to discipline the mind and partly to train the reasoning and classifying faculties, training the student also to enter and understand the world of abstract thought. The study of mathematics leads to the understanding of the laws of Nature both as they affect the individual and as they affect society.

Manual Training.—Including drawing, modelling and possibly painting.

Carpentry, basket-work and the use of tools, gardening, etc., might all come under this head and a graded course should be established. For the pupils who leave school at the age of fourteen years, and especially in rural schools, great importance should be attached to this subject.

It should be added that all study is but a preparation for service, whether in the narrower surroundings of the home, in the wider surroundings of the school and college, of village or town, or the even wider service of the Nation or the Empire. Teachers should encourage their pupils to give of that which they have learned. The elder children should help the younger, the less ignorant should teach those who have few if any opportunities for acquiring knowledge. The school thus becomes a centre for giving as well as for receiving, and vitally benefits its surroundings. From early years the child should therefore understand that every subject of instruction is not only a means toward self-development, but an avenue through which service may be rendered to others, just as he himself is helped by parents and teachers.

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HARVARD UNIVERSITY

HARVARD COLLEGE

AND THE

GRADUATE SCHOOLS

OF

ARTS AND SCIENCES

APPLIED SCIENCE

BUSINESS ADMINISTRATION

DIVINITY

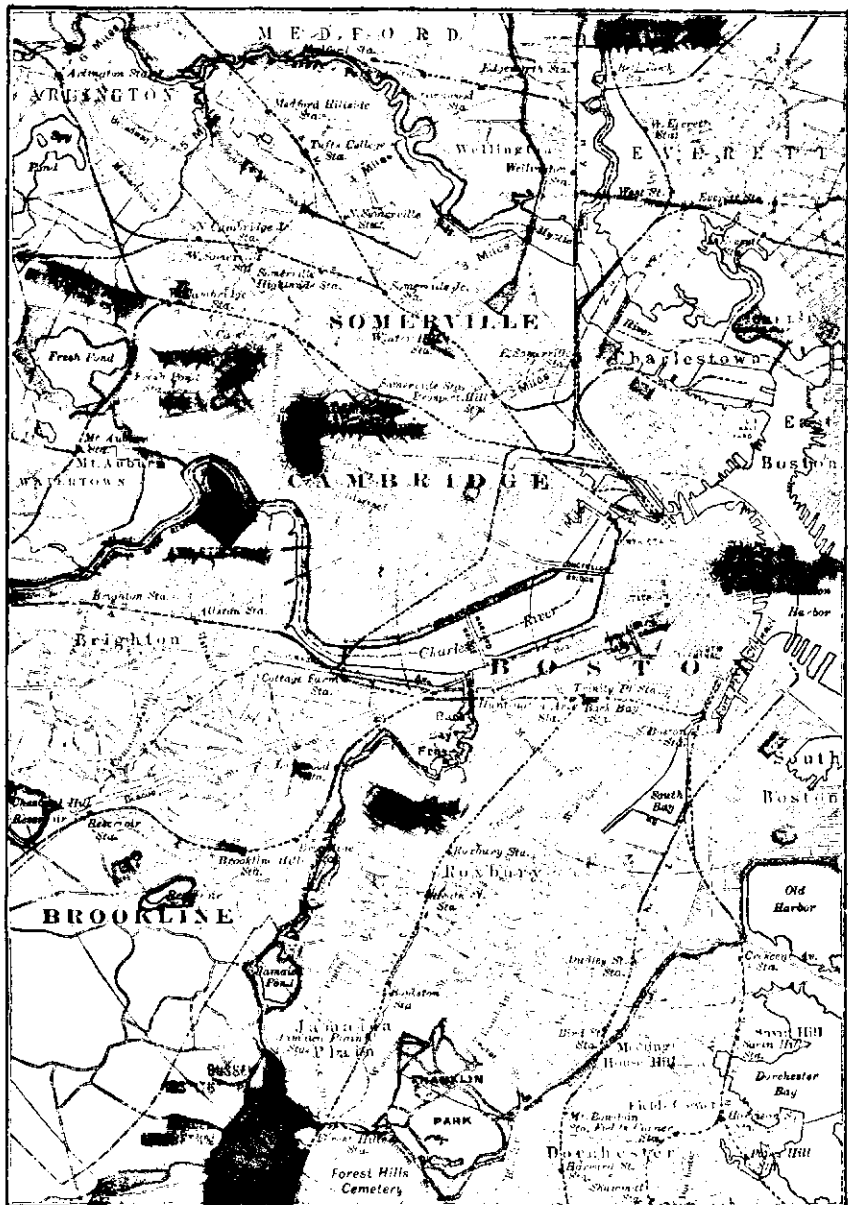
LAW

MEDICINE



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1908



HARVARD UNIVERSITY: LOCATION WITH REFERENCE TO BOSTON

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HARVARD UNIVERSITY

GENERAL STATEMENT

HARVARD UNIVERSITY includes Harvard College, and the following graduate schools requiring a bachelor's degree for admission :

General Organization the Schools of Divinity, Law, Medicine, Arts and Sciences, Applied Science, and Business Administration. This organization is unique among educational institutions. It is believed that a liberal education as given by the normal American college is the best foundation for a professional education, although it is not assumed that all young men can afford the time which this involves, but rather that for the exceptional young man the investment is safe and wise, and one that will be returned to him many fold in his professional career. In professional studies it is a great advantage to a student to associate with graduates only, and an especially great advantage when these graduates are from many colleges and from all parts of the country. In adopting this organization for its professional schools, the University has done as much as a single institution can do to maintain the more liberal course of study in American colleges as an essential part of our educational system. One of the greatest benefits resulting from this general organization is the resort to Harvard of the most ambitious students from all parts of the country, serving as an effective safeguard against provincialism, and promoting keen intellectual zeal and competition.

The present resort to the graduate schools from other colleges is shown in the following figures. In the Graduate School of Arts and Sciences, at the time the last Catalogue was issued, 143 colleges and universities were represented; in the Graduate School of Applied Science, 14; in the Divinity School, 37 colleges, universities and theological seminaries; in the Medical School, 57 colleges and universities, and in the Law School, 121.

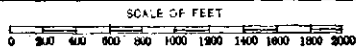
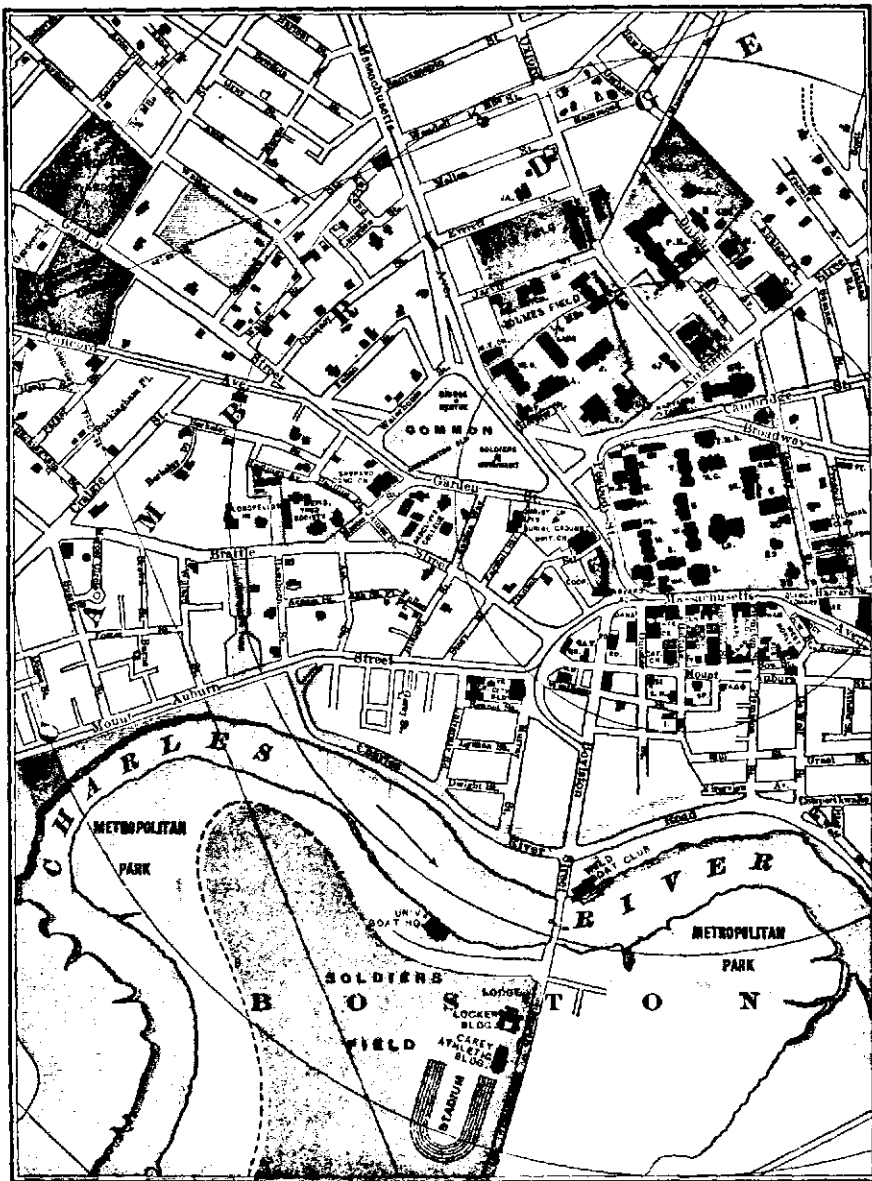
Drawing its students widely the University has also drawn widely for its instructing staff. On the several Faculties 59 other institutions are represented by graduates. It is to be noted that these figures apply only to Faculty members. They do not include the large body of annual appointments which would materially augment the list. The institutions thus represented on the Faculties are: Acadia, Allegheny (Pa.), Amherst, Berlin, Boston, Bowdoin, Brown, California, Cambridge, Case School of Applied Science, Clark, Columbia, Cornell, Dalhousie, Dantzic, Dartmouth, Denison, Edinburgh, Göttingen, Hamburg, Hanover (Pa.), Haverford, Heidelberg, Howard (Ala.), Johns Hopkins, Kiel, Leipsic, Leland Stanford Jr., London, McGill, Marietta, Maryland, Massachusetts Institute of Technology, Michigan, Minnesota, Munich, New Mexico, North Carolina, Northwestern, Ohio State, Ohio Wesleyan, Oxford, Princeton, Queen's (Kingston), Randolph-Macon, Southern California, Swarthmore, Texas, Toronto, United States Naval Academy, Ursinus (Pa.), Vermont, Victoria (Toronto), Virginia, Washington (Mo.), Williams, Wisconsin, Yale, and Zurich.

This pamphlet is intended to describe the University and the conditions of life in Cambridge less formally and more broadly than does the University Catalogue. Inquiries for more detailed information should be addressed to the Secretaries of the several schools, all having the address, Harvard University, Cambridge, except the Secretary of the Medical School whose address is Longwood Avenue, Boston.

Harvard University, founded as a college in 1636, was for over half a century, until the College of William and Mary was chartered in Virginia, in 1693, the only college in the country. The year following its foundation it was established in Newtowne; and the name of the town changed to Cambridge. Although only three miles inland on the banks of the Charles, Cambridge was at that time a frontier settlement. There is still lingering evidence

History and Environment of this fact in the clumps of willows, sprouts from the old stockade against the Indians, crossing what is now a part of the College grounds.

The College is the centre of Old Cambridge. From it westward and northward run the three principal streets, Brattle Street, past the houses of Longfellow and Lowell; Garden Street, past



PETER CHAMBERLAIN, 1917

HARVARD UNIVERSITY: DEPARTMENTS IN CAMBRIDGE

the elm under which Washington took command of the American army and past the Observatory and the Botanic Garden; and Massachusetts Avenue, to Lexington and Concord, the road along which the British soldiers retreated after the Battle of Concord. Near where Garden Street and Massachusetts Avenue separate, on Holmes Place, stood the house in which Dr. Oliver Wendell Holmes was born, and in which were the headquarters of General Ward and of the Committee of Public Safety in 1775. On this stretch of green, June 16, 1775, Samuel Langdon, President of Harvard University, that "hotbed of sedition," offered a prayer for the Continental troops there assembled under Colonel Prescott, before they marched to Bunker Hill. On Holmes Place are now the buildings of the Harvard Law School. Near by is a group of buildings, Massachusetts, Harvard, Hollis, and Holden, which date back to pre-Revolutionary times. These buildings were used as quarters for the Continental Army, the College, for a short time during the Revolution, having been moved to Concord.

The University derives many advantages from its nearness to Boston. The Harvard College Library is at least the fourth and possibly the third library in size in the country, — the Congressional Library being first, — but it is a considerable advantage to have so near the University the Boston Public Library, which is second in size. Other libraries, such as the Boston Athenæum, the State Library, the library of the Massachusetts Historical Society, the library of the American Academy of Arts and Sciences, and the library of the Massachusetts Military Historical Society furnish reinforcement in particular fields. Boston is an important musical centre, and is visited by many lecturers and men of note. A terminal centre for railroads and for steamship lines, it affords many and convenient means of communication with the immediate and more distant parts of the country. The highly developed park system of Boston and of the metropolitan district is one of the great charms of the region.

The more distant surroundings of Cambridge, the coast and woods, the lake regions of Maine and the White Mountains of New Hampshire, the Berkshire Hills of Massachusetts, and the Cape, afford beautiful and varied scenery for the vacation periods. The steamship service to New Brunswick and Nova Scotia gives ready access to a beautiful region, at comparatively slight expense,

for an economical long vacation. The neighboring coast towns of Plymouth, Salem, Marblehead, and Gloucester are reminiscent of Colonial days and are of simple, picturesque beauty.

The general statistics of the University are as follows:— Its material resources are represented by an invested, income-bearing

General endowment of about twenty million dollars, and **Statistics** buildings, laboratories, and museums, valued, conservatively, at twelve million dollars. The grounds for instruction and research, and for the use of students, include 80 acres in Cambridge for varied University purposes; 63 acres across the river in Boston for athletic purposes; 11 acres for the Medical School buildings in Boston; 394 acres for applied biology, arboriculture, horticulture, and allied subjects, in Jamaica Plain, a suburb of Boston; 700 acres on Squam Lake in the foothills of the White Mountains, for the Summer Engineering Camp; and 2000 acres, the Harvard Forest, at Petersham, for field work in forestry; a total of over 3200 acres. To this list may be added the Arequipa Observatory in Peru.

On the staff of the University, there are 566 officers of instruction, and 122 officers of administration, preachers, curators, etc. Not counting the students in the Summer School (1126), the students in the afternoon and Saturday courses for teachers (104), or the students in Radcliffe College (women 420), the number of students in Harvard University at the time of the issue of the Catalogue of 1907-08 was 4012. Harvard University is not co-educational.

There are sixteen dormitories belonging to the University, seven of which surround what is called the College Yard. These buildings are in the main occupied by undergraduates, though much sought for by graduate students in certain departments for which they are convenient. Walter Hastings Hall, on Massachusetts Avenue, a large brick building, well appointed, is near the Law **College** School, and is in large measure occupied by Law **Dormitories** School students. Conant Hall, on Oxford Street, has been given over entirely to graduate students—mainly to students in the Graduate School of Arts and Sciences. Twelve of the rooms in Conant Hall and twenty of the rooms in College House are furnished by the University with almost everything necessary for immediate occupancy. Some of the buildings in the College Yard, while devoid of luxuries, and indeed of rather



HARVARD HALL AND THE WEST GATE

meagre equipment in the way of conveniences, are regarded as desirable because of their associations. Rooms are more attractive when they have associations with the student days of Rufus Choate, Charles Sumner, Edward Everett, Wendell Phillips, William Fitzhugh Lee; of the historians, John Lothrop Motley, Francis Parkman, George Bancroft, and William H. Prescott; of Ralph Waldo Emerson, Henry David Thoreau, James Russell Lowell, Oliver Wendell Holmes; of Edward Everett Hale and Phillips Brooks, and others whose names are as well known locally and held in as affectionate regard. The Harvard Memorial Society has made these associations more real and more personal by posting in each room a printed list of its occupants from the beginning.

A general idea of the cost of rooms in the College buildings can be had from the following figures.

Number of Rooms	Rent	Number of Rooms	Rent
5	\$50 or less	113	\$130 to \$150
80	55 to \$75	160	160 to 200
64	80 to 100	65	210 to 250
72	105 to 125	94	250 to 350

It should be added that many of these rooms are suitable for and are customarily occupied by two students. In fact, one hundred and fifty "rooms" have two bedrooms in addition to the study, and eighty-two have what is called a double bedroom. Some not so described are occupied by two students. The average price of a College room is \$163; taking into account the number of rooms that are occupied by two students, the average cost per student of rooming in a College building during the past year was \$105. The care of all rooms is assumed by the University. Forty per cent. of the rooms are heated by steam. The others are heated by open fires at an annual cost to the occupants of about \$20. The cost of lighting a room is about \$5. Distributing this additional cost, the average cost per student of rooming in a college building, including heat, light, and care, is \$117.

A printed circular giving information in regard to each room can be had by application to the Bursar of the University. A list of the rooms vacant for the following year is prepared early in March. The time and conditions for the application for rooms are given in the University Catalogue.

The University has two dining halls, both of which are run by student associations on a coöperative plan, securing for their members board at cost.

Memorial Hall is the larger of the two dining halls. Its limit of membership is thirteen hundred and twenty. The great hall is of imposing proportions and possesses both dignity and beauty. Its excellent stained-glass windows are impressive memorials of alumni classes or their distinguished members. On the walls are hung portraits of graduates and benefactors of the University. Pictures by Copley, Stuart, and Trumbull make the collection unusually rich in early American portraiture. The kitchen and serving-room have been recently equipped, and are models of cleanliness and convenience. The hall is conducted on a combination table d'hôte and à la carte system. The average price of board for the past year was \$5.33 per week.

Application for admission may be made by any member of the University, and by any one intending to enter the University. Friends may secure seats together by forming a "Club Table." Application for membership should be made on or before September 15, to secure a chance in the first allotment of seats for the following College year. The Hall opens a little before the beginning of College. Application blanks, notice of the date of opening, and further information, may be obtained from the Auditor, Harvard Dining Association, Memorial Hall, Cambridge.

Randall Hall, designed to supply board at a low cost, has a membership of eleven hundred. The board in Randall Hall is entirely à la carte, and averages about \$3.75 per student per week.

A large and well-equipped hospital for the students, the Stillman Infirmary, has been made available by a recent generous gift. It is situated on Mt. Auburn Street, about half a mile from the College Yard, and commands a view of the Charles River Parkway and the Soldier's Field. In return for an annual fee of four dollars, which is charged on the February term-bills of all students registered in the Cambridge departments of the University, any sick student is admitted to the Infirmary and is given, without further charge, a bed in a ward, board, and ordinary nursing for a period of two weeks. It is ordinarily expected that patients shall employ their own physicians, but needy students are attended by the Medical Visitor without charge.

The Infirmary has proved of inestimable value not only by meeting the demands of serious cases, both medical and surgical, and by providing effective means for the treatment and control of contagious diseases, but also by furnishing in trivial cases the simple diet and care necessary for their relief which patients might obtain at home, but which are not available in lodgings. The administration of the Infirmary so commends itself to students that they regard the use of its privileges as a matter of course, and not at all as an extreme measure.

The tuition fees in the University vary in the several schools. In the undergraduate department the fee is \$150 for a student working at the normal rate, and taking a four-year course to complete his work. If, however, he takes more than the ordinary number of courses, as he must do in order to graduate in three years, the tuition fee is thereby increased at the rate of \$20 for each additional course. The tuition fee in the Graduate School of Arts and Sciences, the Graduate School of Applied Science, the Divinity and the Law School is \$150, and in the Medical School \$200. Laboratory courses involve small additional laboratory fees, varying with the subject and with the course. To the tuition fee should be added the infirmary fee of \$4 as one of the fixed charges.

The expenses of room, heat, and light, \$117, of tuition and hospital service, \$154, and of board, \$213, make a total of \$484. This sum does not include laboratory fees, expenditure for books, stationery, or laundry, for music or the theatre, or other personal expenses. It is neither the least nor the greatest amount which a student may reasonably expend should circumstances demand or permit. It is possible, by going a little distance from the College grounds, to secure lodgings at a very low cost. It is possible to secure board at a distance from the College for less than the average board in Memorial Hall; and Randall Hall is less expensive than Memorial Hall by a dollar and a half a week. On the other hand, the private dormitories south of the College Yard are much more expensive than the College rooms and furnish a greater number of conveniences and luxuries, while club and private dining-tables are more expensive than Memorial Hall.

A pamphlet entitled "Students' Expenses and College Aids" has been published by the University, and will be mailed on application. It should be secured by every student whose means are closely limited. The following is the introductory paragraph of this pamphlet:—

"Almost every mail brings to the University at least one letter in which the writer asks if he can work his way through Harvard.

Aids for Students of Limited Means It is hard to answer such letters except in the most general way, for whether the writer will be successful or not depends chiefly on his own energy and ability. The Secretary can assure the questioner that it is possible to work one's way through Harvard, for there are always many self-supporting students in College, and he can also assure him that the experience of many students shows that if a man has health, energy, cheerfulness, a good preparation for College work, and enough money in hand or assured for the necessary expenses of the first year, the chances are that he will never have to turn back. A student who obtains a good start is almost sure to find before the first year is over a way to continue his studies."

The University distributes annually over \$135,000 in prizes, scholarships, fellowships, and other beneficiary aid. In addition to this there has recently been announced a bequest with an income of over \$20,000 a year to be used as travelling fellowships.

For the past twenty years the University has maintained an Appointments Office. The following paragraph is taken from an account in the Harvard Graduates' Magazine (Dec., 1907) of the operation of this office for the past academic year:—

Opportunities for Earning Money "The Appointments Office seeks to provide occupation of both a temporary and permanent nature for the men who, by filing registration cards or blanks, become candidates for one kind of work or another. During the past year, 500 undergraduates and graduates registered as applicants for term-time employment, and 533 for occupation during the summer. They indicate the nature of the work they desire by underlining the various sorts of occupation set forth on the registration cards. Occasionally the card may be returned with the terse, comprehensive statement, 'Willing to do any work that is reputable.' And indeed the

corps of students registered in the Appointments Office may be compared, not inaptly, to some of the volunteer regiments of the Civil War—they can do anything and everything. For example, one man had been a telegraph operator for two years, and came to the University to study electricity. His experience was too valuable an asset to be neglected, however, and he spent part of his nights on one of the New York wires of the Western Union; he had taught school, too, and proved to be an excellent tutor in mathematics. Another youth had a more varied experience. After service as a printer's devil, telegraph operator, clerk in a country store and a great Western department store, he worked his way to the East to school and finally to Cambridge. With only a few dollars in his pocket to meet the College expenses for four years, he naturally took the first job offered him by the Appointments Office, that of sawing wood. By the summer of his junior year, he was earning \$135 a month at the head of an active publicity bureau. He was graduated *magna cum laude*, and is now in Chicago in a position secured for him by the Office."

During the academic year 1906-07 the Appointments Office secured over 1,450 temporary jobs for students in residence. It is impossible to estimate the aggregate value of these, as the Office is not in a position to secure accurate data in regard to the length of time that such employment is continued.

An even more interesting activity of the Appointments Office under the administration of the Alumni Secretary has been that of securing permanent positions for graduates of the several Schools of the University. Within a single year—the past year—the Appointments Office, with the co-operation of the departments, secured, for graduates, permanent salaried positions outside of the University of an immediate annual value of over \$325,000. The potential value of these positions, by promotion, is very much greater than even this large sum. These figures do not include the positions filled through the influence of the Faculties of Law and of Medicine, nor many positions filled by departments and officers of instruction acting independently. The aggregate value of all the positions secured by the University during the year for the graduates of the various departments was well over half a million dollars.

**Employment
after
Graduation**

HARVARD COLLEGE

HARVARD COLLEGE was founded in 1636 upon an appropriation of four hundred pounds by the General Court of the Colony of Massachusetts Bay, and two years later received as a bequest from John Harvard his library and half his other property. For half a century it was the only college in the American colonies. Not until a century and a half had elapsed did it begin to add the professional schools which have combined with it to form the University. It still remains, by tradition, by weight of numbers, and by reason of the fundamental importance of liberal studies, the very heart of the University.

As far back as can be traced, certainly as far back as 1740, admission to the College has been ordinarily by examination. In

spite of all that has been accomplished in the way of improving and standardizing secondary schools in different parts of the country, the College can through its administration of this system treat with the most even justice those candidates who come from neighboring schools, or schools that regularly fit pupils for Harvard, and those candidates who come from schools which are more remote. The subjects in which examinations are offered comprise most of those which are taught in secondary schools; and in order to make a proper allowance for variation in school programmes, and in the opportunities of individual students considerable latitude is permitted to each candidate in the selection of subjects for examination. Thus a student may enter Harvard College as a candidate for the A.B. degree with but one ancient language, and as a candidate for the S.B. degree offering neither Latin nor Greek. A candidate is not required to take all his examinations at one period, but may divide them between different years, or between June and September of the same year, and he will be permanently credited with any subject in which he has passed. Admission may be obtained either through the examinations held by the College, or through

those held by the College Entrance Examination Board. Admission without examination is permitted only to students who have satisfactorily done a considerable amount of college work in another institution, and whose attainments, thus attested, have covered the subjects prescribed for admission by examination.

The instruction in Harvard College, in the Graduate School of Arts and Sciences, in the Graduate School of Business Administration, and in the Graduate School of Applied Science, is under one Faculty, called the Faculty of Arts and Sciences.

Instruction

Instruction is offered in the following subjects: Anthropology, Architecture, Astronomy, Botany, Celtic, Chemistry, Classical Philology, Comparative Literature, Comparative Philology, Economics, Education, Engineering, English, Fine Arts, Forestry, French, Geology and Geography, German, Government, Greek, History, History of Religions, Indic Philology, Italian, Landscape Architecture, Latin, Mathematics, Mineralogy and Petrography, Mining and Metallurgy, Music, Netherlandish, Philosophy, Physics, Physiology, Public Speaking, Romance Languages and Literatures, Romance Philology, Scandinavian, Semitic Languages and History, Slavic Languages, Social Ethics, Spanish, Zoology. The courses in these subjects are arranged in three groups: those "primarily for undergraduates," "for graduates and undergraduates," and "primarily for graduates." The courses in the first two groups are open without question to qualified undergraduate students; but an undergraduate must secure the instructor's permission to enter any course in the third group. In the first and middle groups there are in all 341 courses. Every Freshman is required to take a course in English composition, unless he has anticipated it by a special examination at the time of admission; and every Freshman who has not offered both French and German for admission is required to take in his Freshman year a course in the subject not offered. The remainder of the courses of the Freshman year must be selected from a limited number of specified courses, but he may obtain admission to other courses by securing the written consent of the instructor in the course. This selection is made under the guidance of a specially appointed adviser. The student's choice of studies in subsequent years is limited, in each field of study, by the sequence of courses in that field, thus, no advanced courses in Political Economy can be

ected unless the student has first taken an introductory course known as Economics 1; and again, such a course as Physics 3 must have been preceded by Physics C or its equivalent, and the student must have taken or be taking a course in Calculus. Although the student has no official adviser after his Freshman year, nevertheless every instructor in the University gladly gives his advice to any student who wishes to consult him. The full success of the adviser system depends on the student's disposition to utilize it; but the earnest student finds in the elective system both opportunity and stimulus for his best development.

At the Summer School in Cambridge from the first week in July to the second week in August, and at the Summer Engineering **Summer** Camp at Squam Lake, from the middle of June to **School** the end of August, there are many courses which count toward the degree, and which correspond closely to courses given in the winter session. In certain technical lines, such as surveying and shopwork, courses are given only in the summer session.

The requirements for the degree, formerly stated as four years of study and the passing of examinations on the work of each **Requirements** year, is now expressed only in terms of courses, **for the Degree** seventeen courses being required for the degree. But no student is permitted to take less than four courses or more than six courses in one academic year. It has thus become possible for a student entering clear of admission conditions to complete the work for the degree in three or three and a half years.

Candidates for the degree of Bachelor of Arts and candidates for the degree of Bachelor of Science are enrolled in Harvard College. The requirements for either degree permit free choice among the courses of instruction offered by the Faculty of Arts and Sciences; but a few courses that may be counted toward the degree of Bachelor of Science cannot be counted toward the degree of Bachelor of Arts. The significance of the two degrees is practically identical, so far as the requirements of college work are concerned, the essential difference between them being in the requirements for admission. It is necessary for a candidate for the degree of Bachelor of Arts to offer either Elementary Latin or Elementary Greek for admission; and the candidate for the degree of Bachelor of Science may

offer certain subjects for admission which cannot be counted toward the admission of a candidate for the degree of Bachelor of Arts. Harvard College offers by its elective system the greatest possible freedom of opportunity for those who wish to obtain a liberal education in the arts and sciences, whether as the end of their academic training, or as a basis for further study in Divinity, Medicine, Law, or the various scientific professions, such as Engineering, Architecture, Forestry, etc. Each student is permitted to shape his own programme of work, and is afforded every opportunity to obtain expert advice.

The price of rooms and of board has already been discussed in the general statement, but there are certain aspects of the dormitory question which primarily relate to undergraduate life.

Dormitories The dormitories belonging to the College, some sixteen in number, offer, at reasonable rates, comfortable though not luxurious quarters. Within the past fifteen years a number of well-appointed private dormitories, with relatively high-priced rooms, have been built near the College. They are supervised by resident officers of the University, and form an important part of the University's residential system. There is a prevalent sentiment among the students that everyone should occupy a room in the College Yard during at least part of his College course, and for the rooms in Holworthy and in some of the other buildings there is keen competition. Rooms in private houses are very much like the rooms in private houses in any college town. On the other hand, the clubs at Harvard differ from those of other colleges in rarely providing dormitory accommodation for the members. While there are few, if any, fraternities in the sense in which the term is used elsewhere, the social activities of the students find expression in over one hundred clubs or societies of various sorts, linguistic, scientific, religious, musical, literary, and social.

There are a number of clubs, the activities of which are designed to supplement the instruction of the University in various lines, —

Literary and Scientific Clubs the Cercle Français, the Deutscher Verein, La Sociedad Española, the Circolo Italiano, the History Club, the Natural History Society, the Zoölogical Club, the Chemical Club, and others of analogous purpose. Of the modern language societies, the Cercle Français may be taken as typical. It was

established in the college year 1886-87. At first it was a debating society, conducting its meetings in French. For the past twenty years it has maintained, under liberal endowment, an annual series of lectures given in French by eminent scholars and publicists of France. These lectures are open to all members of the University and, with some restrictions, to the public. The Cercle, which is composed entirely of undergraduates, also performs annually some classical French drama. The other linguistic clubs are less varied in their activities, but likewise serve to stimulate an interest in their languages. The scientific societies are composed sometimes wholly of undergraduates, sometimes of graduates and undergraduates, and meet at frequent intervals for the discussion of scientific subjects. Several debating societies may also be regarded as belonging in this class of organizations.

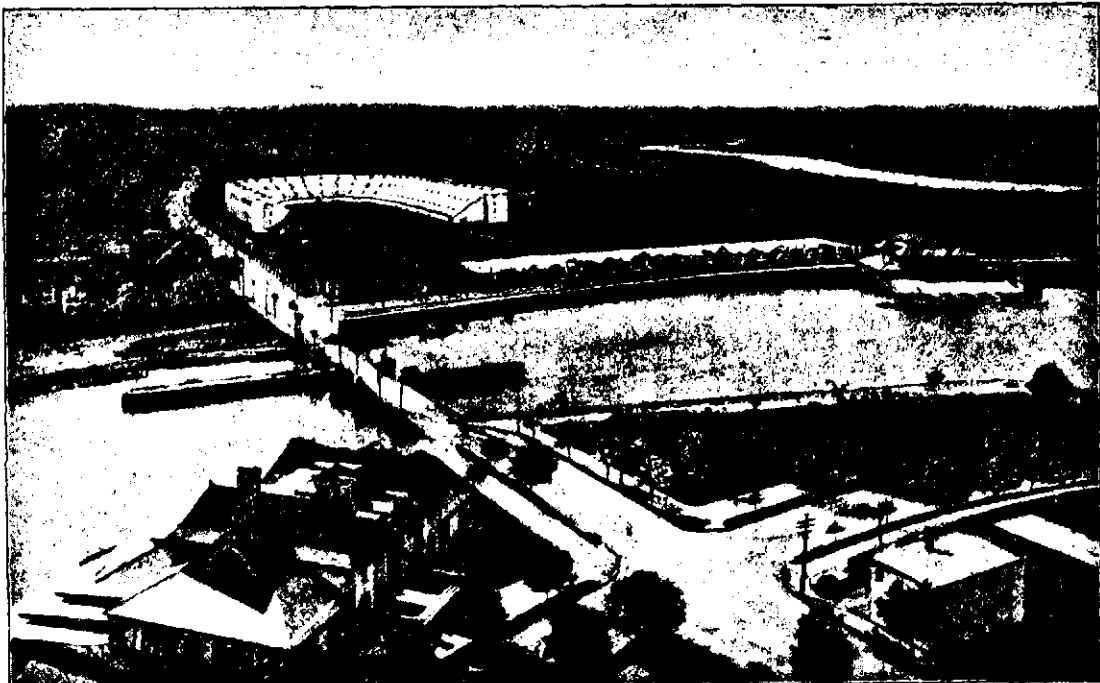
There are a number of clubs devoted to the religious and social service activities of the students. Many of these have their headquarters in the Phillips Brooks House, a simple and beautiful memorial to Bishop Brooks. The Phillips Brooks House Association is a large organization, including all the societies having their headquarters in the House, and also many men not members of any of the constituent societies. These constituent societies are the St. Paul's Society (Episcopalian), the Christian Association (allied to the National Young Men's Christian Association), and the St. Paul's Catholic Club. The Catholic Club now has a house of its own, but retains its connection with the Association. The Association, with a total membership of over five hundred, carries on those general activities which serve all of the societies equally. It maintains an information bureau for new students at the beginning of the year, and gives a reception to the Freshmen, canvasses the Freshman Class in the interests of the Brooks House undertakings, arranges Sunday afternoon gatherings in the House during the winter months with a talk or reading, music, and light refreshments, and carries on various forms of social service work throughout the year. The Social Service Committee of the Association, through a sub-committee, collects clothing and magazines, in such amounts that they are measured in tons, for distribution through various Missions and Associated Charities of Cambridge, Boston, and New York. Another sub-committee issues a call for volunteers, and during

the year arranges entertainments of vocal and instrumental music, readings, legerdemain, etc., in the almshouses, hospitals, sailors' havens, and other philanthropic institutions in Boston and surrounding towns. Still a third committee arranges for students to act as instructors in missions, settlement schools, and boys' clubs.

Of the several musical clubs, the Pierian Sodality, an organization for orchestral music, founded in 1806, is probably the oldest musical association in the country. Under the **Musical Clubs** general guidance of the Department of Music of the Faculty, the Sodality has risen to the very creditable performance of classical music. The Glee Club dates from 1858; the Banjo and Mandolin Clubs are of later origin. These three clubs have a pleasant custom of giving informal concerts in the Yard on warm evenings towards the close of the term. Each of these clubs has its counterpart in the Freshman class. Still another musical organization, the Harvard Musical Club, the purpose of which is to promote interest in the art and theory of music, and to encourage its study in the University, gives an annual concert each winter at which original compositions are produced.

There is one club in the University to which all students are eligible, and to which nearly all belong. The Harvard Union, a **The Harvard Union** gift to the University by a member of the Corporation, is a club of students, graduates, and instructors. Its living room has become the centre of College life, and is the accepted place for mass meetings and for large gatherings of graduates and undergraduates. Each Tuesday evening throughout the year is "Union Night," and for an hour or so several hundred students meet in the living room for readings and lectures by men of national prominence. There is a large dining room for the use of members and their guests, and a smaller dining room for ladies. Any student may become a member of the Union by making application to the Treasurer and paying the annual dues of \$10.

Of the forty or more social clubs in the College, only an insignificant number are secret societies or fraternities, so-called, and **Social Clubs** only a very small number are mutually exclusive. A number have club houses, but without dormitory accommodations. No student restricts his circle of friends to the club or clubs of which he happens to be a member, nor do



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BOAT HOUSES, STADIUM, AND ATHLETIC FIELDS

the clubs furnish the exclusive resources for social enjoyment. Consequently non-membership in a club is neither a conspicuous fact, nor in itself a matter for grave concern. Further than this it is difficult to describe the very flexible club system of the College.

Considerable interest is taken by the undergraduates in their daily and periodical publications. These are five in number. The

Student *Harvard Crimson* appears daily, excepting Sundays.

Publications The *Lampoon*, the college illustrated comic paper, and the *Advocate*, the oldest of the five, are published fortnightly. The *Monthly*, as its name implies, and the *Harvard Illustrated Magazine* are published once a month. Of the Harvard men who in their college days served on the editorial boards of student publications many have become eminent in later life, and some have become famous, notably, Edward Everett, Samuel Gilman, Oliver Wendell Holmes, James Russell Lowell, Phillips Brooks, Roger Wolcott, and Theodore Roosevelt. All of the undergraduate publications are managed and edited by the students themselves, and afford valuable training,

The Gymnasium, which is near the dormitories in the Yard, has locker accommodations for 2400 students; and regular instruction is

Athletics

given throughout the year in various gymnastic sports. On Jarvis, Holmes, and Soldier's Fields there are 60 tennis courts, all of which are occupied on fair afternoons. The two boat houses, the Weld and the University, have locker accommodations for 750 and 500 students respectively, and are equipped with 28 eight-oar shells and barges, and 60 four-oar, pair-oar, and single shells and wherries. Free instruction in rowing is given to members. On the Soldier's Field, 63 acres in area, are the Locker Building, with 1500 lockers and large shower-baths, the Base-ball Cage, covering an area of 7700 square feet, the Stadium, seating 25,000 persons, with foot-ball field and running track, a second foot-ball field and several base-ball fields. Every effort is made to engage a large number of students in moderate exercise. Last year over 200 students were on the various foot-ball teams, and over 150 on the base-ball teams. There were 400 regularly enrolled participants in track and field athletics, over 600 students coming out at the beginning of the season. Over 900 students were members of the Weld and Newell

Boat Clubs, and 650 were regularly on the river. The varsity, class, and scrub games and races, the Leiter Cup Series in baseball, and the Dormitory boat races give excellent and interesting sport for all.

The following, taken from an article by Dean Briggs on "Harvard and the Individual," gives a vivid and accurate picture of Harvard undergraduate life:—

"A story told by Professor Palmer and afterward printed by Mr. E. S. Martin reveals the divided interests of Harvard. On the evening of a mass meeting in Massachusetts Hall for the discussion of some point in the athletic relations between Harvard and Yale, Professor Palmer went to Sever Hall, where Mr. David A. Wells was to lecture on banking; and as he went he was troubled by the thought that 'those boys' would all be in Massachusetts Hall, and that Mr. Wells would have no audience. Arriving at the lecture hall, which seats over four hundred persons, he found standing-room only; and it was not Cambridge women that filled the seats—it was Harvard students. After the lecture, remembering that there should be that evening a meeting of the Classical Club, he went to the top of Stoughton Hall to find there between twenty and thirty men, who, oblivious alike of banking and of Yale, had spent the evening in a discussion of Homeric philology. 'Harvard indifference,' says one critic; 'Harvard University,' says another. Much of the strength of Harvard lies in her variety of interests. Side by side with the boys whose passion is foot-ball are the men whose passion is mathematics or philosophy, who care nothing for intercollegiate politics and less than nothing for intercollegiate athletics; and such is the freedom of Harvard that these men are suffered to follow their own bent, and are not forced into a life with which they have no sympathy. To one who has lived in Harvard College it is the college of all colleges for the recognition of individual needs and individual rights; of the inevitable and delightful variety in talent and temperament, and even in enthusiasm. When all the people in one place are interested in one thing, it may be inspiration, and it may be provinciality. When everybody in a university shouts at every ball game, athletics prosper, but culture pines. Where Greek and the chapel are elective, base-ball should not be prescribed; and where base-ball is not prescribed,

there are sure to be individuals who cannot always occupy either the diamond or the bleachers.

“We grant,” it may be said, “that Harvard allows and encourages a man to lead an independent intellectual life, to get all the Greek he wants, and all the chemistry he wants — and no more; but what of human fellowship, the real and great and permanent blessing of college life?” The answer of any one who knows the College is this. If a man is interested in anything outside of himself, he will get human fellowship in Cambridge; if he is not, he will not get it anywhere. The best friendships, as divers wise men have told us, are based on common interest in work. Editors of a college paper, debaters in a college team, students working side by side in a laboratory — or even in athletics, now that athletics have ceased to be play — these men, and not the fellow poker-players, are laying the foundation of permanent friendship. Harvard College contains hundreds of groups of men who come together for work which they do for the love of it; and in some one of these an earnest man is sure to find or make his friends. Is it better to know everybody in a class of fifty or fifty in a class of five hundred? Which offers the more reasonable and promising basis for the friendship of a life? Is there not, after all, some danger when even affinities are, as it were, prescribed and provincial — some danger in that extempore intimacy, that almost instantaneous swearing of eternal friendship, which a small community may demand?

“But what of the relation between student and instructor?” In a small college the Faculty know, or think they know, every student. Between the large college and the small there is a real difference in the relation of the instructors as a whole toward the students as individuals, and in the relation of the students as a whole toward the instructors as individuals. In Harvard University are over three hundred professors, instructors, and assistants under the Faculty of Arts and Sciences alone, of whom more than a third are members of that Faculty appointed either for a term of years or without limit of time. No teacher knows by sight every other teacher; still less does any teacher know every student. Yet many teachers know more students than they would or could know in a small college; and every student is known by several teachers besides his Freshman ‘adviser.’ Even the

large lecture courses are so combined with laboratory work or conferences or excursions that the students in them are brought into contact with the younger teachers if not with the older ones. There is, I believe, no college in which the relation between instructor and pupil is more delightful. The maturer students are frequently consulted in matters of general importance and frequently called upon to help other students who need the strength that comes from strong friends. Many instructors invite students to their houses, or keep certain hours clear, as the University preachers do, for any and all students.

“Within a few years the wives of certain University officers have instituted a series of afternoon teas on Fridays between Thanksgiving and the first of March, and have invited all members of the University. The teas, on which students at first looked sceptically if not scornfully, are now fairly established. They have done much in giving newcomers what they sadly need — the society of refined women — and in giving all students opportunities of meeting persons whom it is a privilege to know. The room used for the teas is the large parlor of Phillips Brooks House; the rug in the centre was Bishop Brooks's own; and the bust in the adjoining hall, with the tablet beside it, leads men's thoughts to him for whom the house was named, and in whose honor it was dedicated to hospitality as well as to piety.

“The homesick Freshman from a distant State finds at Cambridge a better welcome than he expects, though no kindness can at once and forever annihilate homesickness. Some years ago a well-known professor walking through the College Yard at the beginning of the autumn term met a young man whose aspect prompted him to say: ‘Are you looking for anybody?’ The young man answered: ‘I don't know anybody this side of the Rocky Mountains.’ Of what immediately followed I know nothing, but can guess much. Of one thing I am sure — the young man is to-day a loyal graduate of Harvard College. Nowadays the newly arrived student finds waiting for him, even before he meets his ‘adviser,’ a committee of instructors and undergraduates whose business and whose pleasure it is to help him adjust himself to his new surroundings. Nor has he been long at the University before he is invited to the room of a Junior or a Senior, to meet there a few members of his own class, as well as members of other classes. There he

and his classmates are entertained by the older men, who often give them serious and sensible advice; and there they are made to feel that they are 'taken into the team.' 'Entertained,' I said, not hazed, as of old; and though the decline and fall of hazing may cut off Freshmen from the instantaneous friendships of coöperative self-defence, few will regard it as a mark of degeneration. To at least one of these entertainments every Freshman is invited, for the large committee of Seniors and Juniors in charge assigns each Freshman to some one man. Freshmen are invited, also, by their class president to social evening meetings, for which purpose, since scarcely any room can hold them all, the class is sometimes divided into squads of fifty or sixty. Again, in the new Harvard Union, which, like so much else, the University owes to Mr. Henry L. Higginson, the newcomer finds countless opportunities of scraping acquaintance with his fellows.

"Probably the sick student is better and more promptly cared for at Harvard than at any other university in the world. Here, as elsewhere, a taciturn and courageous person may bear much pain and disease without revealing his bodily state to a physician; but nowhere is such conduct less necessary and less excusable. Every student not well enough to attend College exercises need only send word to the Medical Visitor, who will come at once to his room and tell him what to do. If the case is simple the Medical Visitor gives advice and, if need be, a prescription; if it requires prolonged medical attendance, he sends for any physician that the student may name. He himself keeps fixed office hours in the College Yard for consultation with such students as need him; nor does he receive pay for any part of his work as Medical Visitor beyond his salary from the University. The promptness and the devotion of this officer reduce to a minimum the danger of contagion from epidemics. For the care of the sick, the Stillman Infirmary has already a nearly perfect equipment; and the new ward for contagious diseases will make the Infirmary complete.

"As to moral aid for the individual students, no one who is not inside of Harvard life can begin to know how many young fellows are aiding the weaker brethren to lead clean, sober, and honest lives; how much responsibility of all sorts the best students will take, not merely for their personal friends but for anybody that they can help. Some years ago a young man of strange and

forbidding character was seen running round and round on a Cambridge sidewalk, imagining that he was Adam flying from temptation; and though obviously insane he was put into the station-house. The case was made known to a student who as a child had attended the same school. He had never known the sick man well, and had never known good of him; yet he got his release from the station-house, promising to be responsible for him through the night. With the aid of a fellow-student he took into his own rooms the insane man, and gave him the bedroom. He himself with his friend sat up all night in the adjoining study. Into this study the madman would issue from time to time, making night hideous to the two watchers; but they did not lose patience. In the morning the student in charge secured a physician, assumed the responsibility of a guardian, drove with the sick man to the nearest asylum, advanced money (of which he was notoriously short) for necessary expenses, and then, exhausted, hastened to New York to meet his fellow-members of the Hasty Pudding Club (who had started, I believe, the night before) and appeared as a smiling star in the performance for which he had been so strangely prepared. No casual observer would have dreamed that in this apparently thoughtless person were the quick courage and devotion which made inevitable the acceptance of a revolting service for a youth who was almost an outcast.

“The University is a little world with all the varied enthusiasms of athletic, intellectual, social, and moral life; and in spite of the temptation here as in other worlds, little or big, for men to break up into small and exclusive groups, the number of students who have with their fellows an acquaintance wide and varied is exceedingly large. Our wiser students recognize the truth of the late Lord Dundreary’s famous proverb, ‘Birds of a feather gather no moss,’ and act accordingly. Moreover there are few communities, if any, in which a man may stand more firmly on what he himself is and does, trusting to be judged thereby. I doubt whether any student within my memory was ever more warmly admired and loved than Marshall Newell, a farmer boy. He was, it is true, an athlete, ‘an athlete sturdy, alert and brave.’ Athletics made him widely known; what made him widely loved was not athletics but the strong, healthy, simple and fearless heart, which revealed itself in his athletics as in everything else about him; and when he died

one of the social leaders of his college days said sincerely that it was worth while to spend four years in Harvard College, merely to have known such a man as he.

“Not many years ago a big country boy named Adelbert Shaw entered Harvard College as a special student. He had been fitting himself for Wesleyan University, and had changed his plans so suddenly that he could not take all the Harvard examinations for regular standing. On his arrival he knew but one or two persons in the University. He had little capital besides a strong body and mind, an unmistakable good nature, a big earnestness, and an unusual aptitude for turning from one kind of work to another with equal devotion to each and no waste of power in the transition. On the foot-ball field he made people laugh by his awkwardness and by the beaming good humor with which he hurled himself into the scrimmage; in the class-room he was as earnest as on the ball field; in his own room, notwithstanding his sudden and universal popularity, he worked hard, and in study hours kept his door closed to all but the few that he knew best. He was not a great athlete, though he might have become one. He played in the Freshman foot-ball team, was a substitute in the University foot-ball squad, and later appeared as a candidate for the University crew. In the spring of his first year at Cambridge, he was thrown out of a single shell and was drowned. His body was sent home; but after it had gone, a service was held in Appleton Chapel, which contained that day more students than I have ever seen in it before or since. In Holden Chapel the athletes had a service of their own; and the student who took charge of it could scarcely speak. Shaw was a religious man, earnest in religion as in all things; yet he was never praised more highly than by a student who was known as a cynic. In a few months this unknown country boy had won the respect and the affection of the College that some still call indifferent, undemocratic, an aristocracy of Boston society and New York wealth.

“If a youth makes no friends in Cambridge, it is stupendously his own fault. I do not say that it is impossible for a Harvard student to go off by himself, dig a hole, lie down in it, and stay there — as he might not be able to do at a small college; I do say that those who affirm Harvard to be undemocratic or to value men for their money are either misinformed or defamatory. I could

name plenty of men whom heaps of money did not save from social failure in Harvard College; and even more whom narrow means and want of family connection did not cut off from almost universal popularity. Students at Harvard, like students elsewhere — like all men, young or old — may misjudge their fellows, and, misjudging them, may use them cruelly. Yet even in such cases most of the blame belongs usually to the misjudged man. The student who bears himself well and does something for his class or his College is sure eventually to succeed. In the Freshman year a few prizes may be given to attractive loafers; but in the long run the Harvard public insists on some form of achievement. No individual who does anything worth doing, and does it with all his might, need be lost in the crowd at Harvard; and, taken for all in all, Harvard is the best place I know for the individual youth."

DIVINITY SCHOOL

A LEADING purpose of the founders of Harvard College was "to advance learning and perpetuate it to posterity; dreading to leave an illiterate ministry to the churches, when our present ministers shall lie in the dust." Accord-

History ingly for two generations, the College was virtually a theological school in its curriculum and dominant influences, and in the purposes of its students. With the rise of new interests, however, the college gradually lost this initial character, although the incumbent of the Hollis Professorship of Divinity, the first endowed chair in the College, supervised the studies of young men preparing for the Christian ministry. In 1811, Dr. Henry Ware, who had been appointed Hollis Professor in 1805, began a course of exercises with resident students in theology; in 1817, the first public exercises of such students were held; and in 1819 the Faculty of Divinity was formally organized, and the School became distinct, although not divided, from the College. In 1882, by the requirement that every candidate for a degree should already have received an A.B. degree or its equivalent (a phrase which has always been very strictly interpreted), the School became the first graduate professional school.

In 1815, the Corporation appealed to the friends of the College for contributions to increase the means of theological instruction.

The School The subscribers to this fund formed a "Society for Non-sectarian promoting Theological Education in Harvard University," to which was intrusted the principal management of the School, subject, however, to the control of the Corporation and Overseers. In 1830 the Divinity School passed under the direct and exclusive control of the University. Although the members of the Society were Unitarians, they laid down the principle, and incorporated it into the constitution of the School,

that "no assent to the peculiarities of any denomination of Christians shall be required either of the instructors or students." Thus from the first the Divinity School was formally committed to the principle of non-sectarianism, but for many years it was practically identified with Unitarian Congregationalism; its professors were of that denomination and, as a rule, no other churches welcomed its graduates. When in 1878-79 President Eliot appealed for an increase in the endowments of the School, it was with the express declaration that the government of the University proposed to emphasize and make practically effective the non-sectarian principle, and the School is now thoroughly committed to this ideal of theological education. Its present Faculty consists of three Trinitarian and four Unitarian Congregationalists, and one Baptist, and during the past thirty years its students have entered the ministry of seventeen different denominations. All of its courses of instruction except those of a purely technical character, like Homiletics, are open to members of the College and the Graduate Schools, and its students, in turn, resort to courses offered by the Faculty of Arts and Sciences. This means that intellectually the Divinity School recognizes the same presuppositions and adopts the same methods that prevail in the University at large. This is the feature of the School which especially commends it to students interested in "the serious, impartial and unbiassed investigation of Christian truth."

The Divinity School has adopted the elective system, offering over forty courses of instruction, not all of which, however, are given in any one year. Fourteen courses are required for the degree of S.T.B. The only restriction upon free election is that a candidate for a degree must not have wholly neglected any one of the departments of instruction. In addition to the courses offered by members of the Divinity Faculty, students have access to all except laboratory courses given by the Faculty of Arts and Sciences, of which two, if approved by the Divinity Faculty, may be counted towards the degree of S.T.B. All other privileges of the University are freely open to students of the Divinity School.

Besides this relation to the University, students have an additional advantage in the nearness of the School to a large city

whose social conditions and philanthropic organizations afford opportunities for sociological training and research. Under the leadership of Professor Peabody of the Divinity Faculty, the Department of Social Ethics has become of exceptional importance and the new Social Museum offers unequalled facilities for the comparative study of social problems.

Students who are especially interested in the History of Religions will find here an unusually large number of courses, comprising not only those offered by the Divinity Faculty, but also others in various ethnic religions conducted by members of the Faculty of Arts and Sciences. The Peabody Museum of Archaeology, and the Semitic Museum under the care of Professor Lyon of the Divinity Faculty are rich in material of value to serious students in this field.

The expenses of students in the Divinity School are about equal to those of students in other Cambridge departments of the University. The School has a dormitory of its own with a very attractive common room. The average rent of rooms in Divinity Hall is about sixty dollars a year. The Faculty is able to offer needy students of ability and promise scholarships ranging from \$200 to \$300 a year, the amount being determined by the student's academic record.

Although the academic year of the School coincides with that of the University, and students are strongly urged to begin work in October, it is possible for those who cannot enter at that time to join the School at the beginning of the second half-year, in February, and pursue courses counting for a degree.

The Faculty of the Divinity School has maintained since 1899 a Summer School of Theology designed to provide an opportunity for clergymen and students of theology to meet for the study of subjects of theological interest and to inform themselves concerning the tendencies and results of modern theological scholarship. Although admission to the School is not restricted, about eighty per cent. of the students are ordained ministers, and ninety per cent. are holders of a Bachelor's or a Doctor's degree.

Inquiries in regard to the School should be addressed to the Dean of the Harvard Divinity School, Divinity Library, Cambridge, Mass.

The Andover Theological Seminary has removed to Cambridge and become affiliated with Harvard University. In accordance with the agreement entered into by the governing bodies of the two institutions, all courses in Andover Seminary are open, without extra charge, to students of the Harvard Divinity School paying the full fee and, with the approval of the Faculty, may be counted towards the Harvard degree of S.T.B.

LAW SCHOOL

THE Harvard Law School was established in 1817 and is the oldest of the existing law schools in the country. It has attained its present position among law schools by the high professional standing of its graduates and by the invention and introduction of a stimulating method of legal instruction, the so-called Langdell or Harvard Case System, which has since been widely adopted, and of which Sir Frederick Pollock, Regius Professor of Law in Oxford University, has said, "I do feel sure it is the best way if not the only way to learn law."

The Law School with its library was housed in what was called "Second College House" from 1817 until its removal to Dane Hall in 1832. In 1845 Dane Hall was enlarged and the addition became the main part of the building, containing the library on the first floor, and the lecture room on the second. In 1883 the School and library were removed from Dane to Austin Hall. Austin Hall, a brownstone building, and a good example of Richardson's architecture, was expected to meet all demands for fifty years. Within twenty-five years, however, by the growth of the library and the increase in the number of students, it became overcrowded. A new building has just been erected by the Law School, much larger than Austin Hall, in a stately style of architecture, and named, in affectionate remembrance, after Dean Langdell. The Law School now occupies both buildings, Austin Hall and Langdell Hall; and the two adjacent dormitories, Hastings Hall and Cannett House, are given over to law students so far as their needs require.

Starting as a somewhat loose system of lectures, the instruction gradually became more definitely organized, but for the first fifty years the work of the student was not tested by formal examinations. At first the degree was based in large measure on residence and attendance on the lectures of the school, and even this require-

ment was but loosely enforced. Formal examinations for the degree were introduced in 1871. From that time examinations of increased severity have been required in all courses and have served as a basis for conferring the degree.

Since 1877 a three years' course has been prescribed for the degree. In 1877 a special examination was required of all candidates for admission as regular students who were not college graduates. In 1896 the rule was formally adopted that only graduates of approved colleges and persons qualified to enter the Senior Class of Harvard College would be admitted as regular students. Three years later, in 1899, this requirement for admission was still further increased, so that only graduates of approved colleges, Harvard College included, could secure admission as regular students. Even with this high requirement, rigidly enforced, over seven hundred students registered in the School in the autumn of 1907.

The Degree of Bachelor of Laws is now granted to holders of an academic bachelor's degree after a residence of three years and the passing of examinations in the entire course. The programme of study includes, in the first year, Contracts and Property, Torts, Agency, Civil Procedure at Common Law, and Criminal Law and Procedure; in the second year, Bills and Notes, Evidence, Jurisdiction and Procedure in Equity, Property, Sales, Trusts, Admiralty, Bankruptcy, Carriers, Damages, Persons; and in the third year, Conflict of Laws, Constitutional Law, Corporations, Insurance, Partnership, Property, Suretyship and Mortgage, Jurisdiction and Procedure in Equity, and Quasi-Contracts.

The most epoch-marking event, not merely in the history of the Harvard Law School, but in legal instruction in the country at large, was the appointment, in 1870, of Christopher C. Langdell as Dean of the School. Before his administration eminent jurists had taught the students by lectures supplemented by the study of legal treatises. The lecture and recitation methods were not thought inadequate; in fact, they were the only methods employed anywhere, and are the methods still employed in some though in a steadily decreasing number of schools. Professor Langdell, though bred under this system, saw that, while it might give in easily accessible form such principles of law and practice as could be specifically formulated, it did not

give training and therefore facility in the actual methods of the best legal practice. A practising lawyer presents his case with citation of other cases, and his final authority and test of law lie largely in court decisions. Professor Langdell introduced first into his own courses, from whence it spread to those of the other teachers, a system of instruction whereby the student was trained to use as original authorities the published decisions of courts. He collected from the reports cases adapted to show the development of a legal doctrine, set his young men preparing five or six cases a day, and then at the following lecture, by statement, discussion, and criticism in the class-room, forced the students to extricate for themselves from these original sources the legal principles that their fathers took second hand. For two decades the success of this eminently reasonable innovation was not generally admitted. Under this severe form of instruction the attendance in the School did not gain greatly in numbers, notwithstanding the natural resort to the School of increasing numbers of Harvard graduates. But by 1890 the young lawyers trained at Harvard in the early seventies had made their mark in their profession. It was found that the Harvard-bred lawyer was in his practice sound and eminently successful. Time had proved the efficiency of the new system. The attendance in the Law School began to increase rapidly, and the Harvard Case System spread throughout the law schools of the country, and has been adopted in whole or in part by most.

With such a system of instruction the library becomes a most important feature of the School. As Professor Langdell said of the library in his second annual report, "Everything else will admit of a substitute, or may be dispensed with; but without the Library the School would lose its most important characteristics, and indeed its identity." And in a later report Professor Langdell wrote, "The work done in the Library is what the scientific men call original investigation. The Library is to us what a laboratory is to the chemist or the physicist, and what a museum is to the naturalist." At the beginning of the School a small appropriation was made for the purchase of a law library, and to this nucleus many important additions were made from time to time, some of which were unique. Thus Charles Sumner speaks of Mr. Livermore's "splendid donation"

and of a "valuable presentation of Mr. Joseph Story and other distinguished friends of the legal profession," and Quincy in his history, published in 1840, refers to Mr. Livermore's gift of books as "probably not exceeded, and perhaps not equaled, by any other collection of the same size in America, if it be in Europe." Many other gifts have come to the library and it has been added to by purchase, particularly since 1870. In many most important respects it is unique. The Law Library, which Professor Dacey of Oxford has pronounced "the most perfect collection of legal records in the English speaking world," now numbers over 105,000 volumes.

Law clubs give the students experience in the forms of legal practice. They are in the main permanent organizations. Each law club elects eight members from the incoming class, and on these members devolves the greater part of the active duties of the club for the year. The clubs meet weekly. Before each meeting some member of the second-year class or some member of the Faculty is asked to preside as Chief Justice. Whoever is so chosen proposes a supposititious case involving a disputed point of law for argument before the meeting. Counsel are appointed from the first-year members of the club; the other members act as Associate Justices. Several days in advance of the hearing the counsel submit their briefs to the Justices for examination. At the meeting the case is formally argued by counsel, and oral decisions are given *seriatim* by the Justices *in banc*. These clubs are most useful auxiliaries to the regular work of the School, requiring their members to prepare and argue each week cases illustrating the most difficult problems under discussion in the lecture rooms. Several have been in existence for many years, and include in their list of former members jurists of national reputation.

The intercollegiate and national character of the Law School is shown by the following statistics: Of the 716 students enrolled in the School this year 60 per cent. are graduates of colleges other than Harvard, 121 institutions being represented. Over 58 per cent. of the students now in the School are from outside of New England. About 60 per cent. of the graduates are practising law outside of New England.

Inquiries should be addressed to the Secretary of the Harvard Law School, Cambridge, Mass.

MEDICAL SCHOOL

THE Medical School, the oldest of Harvard's professional schools, was founded in 1781, mainly through the efforts of John Warren, a brilliant young army surgeon of the Revolution. The School, at first located in Cambridge, was a territorial as well as an organic part of Harvard College. At that time Cambridge, although but three miles distant in a straight line, was a two hours' journey by land, separated by the river and a deep bay of marsh land. The School was thus remote from hospital and clinical facilities. In those days the value of hospitals as teaching centres was less appreciated than at present and young men received their bedside training as assistants of general practitioners. Gradually, however, the need of being near the larger clinical facilities in Boston made a change of location expedient and in 1810 the School was moved to Boston. In 1816 it was moved again, this time to a new building, the first erected especially for it. In 1847, it was moved to a building next the Massachusetts General Hospital, and in 1883 to another new building, so large as to be criticised for its ambitious dimensions, and justified only on the ground that it was "to be the home of medicine for generations." Less than a single generation had elapsed, however, before the rapid increase in the number of students and improved methods of instruction demanded still more enlarged quarters. Of the five marble buildings, which together now house the Medical School, each is as large as the building from which the School moved, the building which less than twenty-five years before was thought to be on an extravagant scale. The five new buildings connected by covered passageways entirely close three sides of a large court which on the fourth side looks down the Avenue Louis Pasteur to the Fenway, the main artery of the Metropolitan Park System of Boston.

This stately group of buildings, a notable addition to the architecture of the City of Boston, is the result of prolonged study, and combines many features which render the buildings particularly

well adapted to their intended uses. Each building, with the exception of the administration building, is in the form of two wings connected by a central section, a plan which furnishes almost ideal illumination for laboratory work. The general arrangement of each building permits of future increase in floor space by the extension of the wings without any change in the façade of the buildings as seen from the central court. The unit system of rooms has been adopted, a unit to consist of a window and half a pier on each side. These units form single research rooms, but as the only walls of the building which are permanent are the outside walls and those along the corridors, the arrangement of rooms can be changed to suit the needs of succeeding years. In the central section of each building is a large amphitheatre, easy of access to students and instructors working in either wing. The laboratories have been furnished and equipped with special reference to the comfort of students and facility for work. Near each laboratory is a library containing the books and journals most closely related to its especial interests.

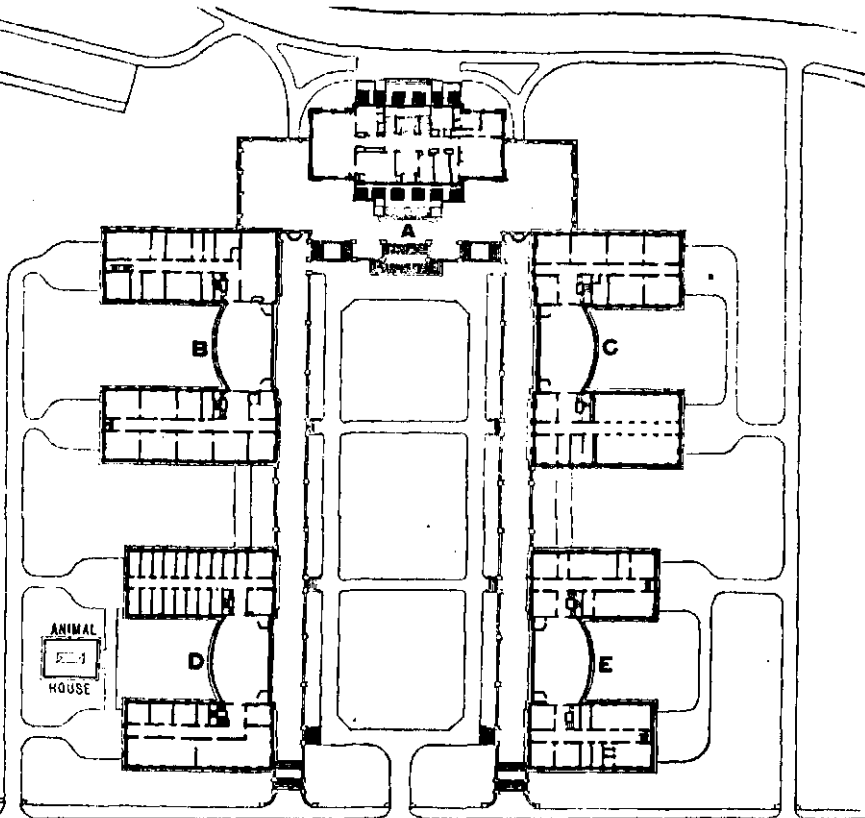
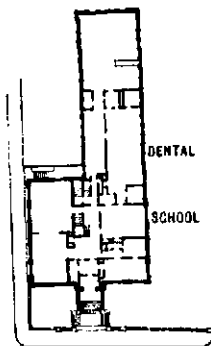
Building A, at the end of the quadrangle, contains the administrative offices and lecture rooms, while across the whole of

**Museum
and
Laboratories** the third floor stretches the Warren Anatomical Museum, amply lighted by sky-lights and side windows. This collection, begun by John Warren

in 1799, is a most valuable teaching collection, and is well endowed for maintenance and increase. The buildings on the sides of the quadrangle are used by the several departments and are grouped as follows: B, anatomy, comparative anatomy, histology, and embryology; C, physiology, comparative physiology, biological chemistry, and theory and practice of physic; D, pathology, bacteriology, neuropathology, and surgical pathology; E, hygiene, pharmacology, comparative pathology, and surgery. In buildings B, C, and D are large combined departmental libraries, and in building E four small departmental libraries. The five buildings, three the gift of Mr. J. Pierpont Morgan, one the gift of Mrs. Collis P. Huntington, and one the gift of Mr. David Sears, were erected at a cost of about three million dollars. To these buildings other friends of Medical Science and of Harvard contributed liberally. At the same time a million dollars was given for endowment by Mr. John D. Rockefeller.

KEY

- A**—ADMINISTRATION BUILDING:
Dean's Office, Faculty Room,
Lecture Rooms, Warren Museum.
- B**—Anatomy, Comparative Anatomy,
Histology, Embryology.
- C**—Physiology, Comparative Physi-
ology, Biological Chemistry, The-
ory and Practice of Physic.
- D**—Bacteriology, Pathology.
- E**—Hygiene, Comparative Pathology,
Pharmacology, Surgery.



HARVARD UNIVERSITY: MEDICAL SCHOOL BUILDINGS

Equally important with its laboratories are the hospitals with which a medical school is associated, and in this the Harvard Medical School is peculiarly fortunate. Shortly after the removal of the Medical School to Boston, in 1810, the Massachusetts General Hospital was founded under the auspices of teachers in the School. For nearly one hundred years it has continued under these auspices, its history closely associated with the history of Harvard. The famous Boston City Hospital, also, has ever been in cordial and intimate relations with the School and is a most valuable ally. Besides these general hospitals, the Children's Hospital, the Long Island Hospital, the Massachusetts Eye and Ear Infirmary, the Boston Lying-in Hospital, the Carney Hospital, the Good Samaritan Hospital, the Free Hospital for Women, the Infants' Hospital, the Boston Insane Hospital, the Danvers Insane Hospital, and the Boston Dispensary are closely related through their staffs, and devote their clinics largely to the Harvard Medical School. So intimate is this connection between the hospitals and the School, and so valuable to each, that the Good Samaritan Hospital has already moved to be near the Medical School, while the Children's and the Infants' Hospitals have secured land which was a part of that originally purchased by the School, and are planning to build and move in the near future. Still another portion of the School land has been secured by the trustees of the Peter Bent Brigham Hospital, a magnificently endowed institution, which is to be built immediately, and will contribute, as far as it can consistently with its hospital functions, to the furthering of medical education. The Laboratory for Research in Nutrition, of the Carnegie Institution, is also on land which originally was part of the Medical School tract. Of the original twenty-seven acres secured by the University when the change of site was contemplated, all but the eleven acres needed by the School have thus been taken. When complete, these six institutions will form a group unique in service to medical science both in magnitude and character.

A detailed statement of the clinical facilities of the hospitals is shown in the following table: —

STATISTICS OF BOSTON HOSPITALS

	No. of Beds.	No. of medical cases treated annually.	No. of surgical cases treated annually.*	Out-patient Department number of visits annually by patients.	No. of autopsies annually.
Mass. General Hospital	303	2,021	3,496	107,063	204
Boston City Hospital	1,157	6,586	6,995	163,927	244
Carney Hospital	200	591	1,840	53,414	13
Long Island Hospital	300	3,147	....	6,069	69
Children's Hospital	100	464	1,011	27,010	21
Infants' Hospital	24	194	52	13,166	10
Boston Lying-in Hospital	52	....	765	2,067	....
Boston Dispensary	....	....	....	107,855	....
Mass. Charitable Eye and Ear Infirmary	160	....	3,169	78,493	4
McLean Hosp. for Insane	220	373	....	....	....
Boston Insane Hospital	773	1,162	....	....	....
Danvers Insane Hospital	1,374	1,866	....	....	104
Free Hospital for Women	54	....	388	13,115	3
	4,717	16,404	17,716	572,179	672

* With surgical cases are grouped ophthalmic, gynaecologic, obstetric, and orthopedic cases.

Lectures, clinics or demonstrations are held in all of these hospitals. In them every student has the opportunity, individually and in small sections, of making a daily study of ambulatory and bed patients under the supervision of competent instructors. There is abundant clinical material for all, and each student sees in his clinical courses a large variety of diseased conditions, many of them so often, that he graduates with a considerable experience based on personal observation. He sees close at hand many operations. At the Lying-in Hospital and in the homes of patients he gains a practical experience in obstetrics.

At the Massachusetts General Hospital, Boston City Hospital, Boston Dispensary and the Carney Hospital, there are in addition to medical and surgical services, departments of orthopedics, dermatology, laryngology, ophthalmology, neurology and gynaecology. Among the special features of some of these hospitals may be enumerated the very extensive equipment of the departments of mechanotherapy (Zander apparatus), and hydrotherapy at the

Massachusetts General Hospital; the Social Service Department of the same institution; the South Department of the City Hospital, with its many cases of diphtheria and scarlet fever; and the Relief Stations of the City Hospital with their very extensive accident services. Ample opportunity for the study of tuberculosis is furnished by the Municipal Consumptives' Hospital,—the out-patient department and sanatorium day-camp of which are completed and in operation, while its large hospital for advanced cases is soon to be opened. The House of the Good Samaritan and the Long Island Hospital have many cases of advanced tuberculosis for study, as well as many cases of other chronic diseases.

At the Massachusetts General Hospital and the Boston City Hospital large well equipped pathological and clinical laboratories are maintained. These are under the direction of members of the Pathological Department of the Medical School, and in them excellent opportunity for study and research is furnished.

There are more than eighty appointments annually of internes in the various hospitals, and nearly as many more of assistants

Hospital in the out-patient departments. Appointments are **Appointments** for terms of one to two years according to the service chosen. With this large number of hospital appointments open each year it is possible for every graduate to secure an internship in a hospital. These appointments are all made on the basis of a competitive examination.

Degrees were first granted by the School in 1788. The degree of Bachelor of Medicine was conferred until 1810, when the degree was changed to Doctor of Medicine. From the **Courses for the Degree and Requirements for Admission** first the degree was based on a two-year course at the School, two years of study with a practising physician or surgeon, and examinations. The course was changed from a two to a three-year course in 1871. In 1880 a four-year course was introduced parallel to the three-year course. This course was strongly recommended by the School and was required in order to receive the degree *cum laude*. In 1894 the three-year course was abandoned and four years were required for the degree of Doctor of Medicine. Before 1901 admission was either by examination or by holding a bachelor's degree with evidence of having pursued certain required subjects. Since 1901 a bachelor's degree in arts, literature, philosophy or science has been

required for admission to the School, and in addition certain training in inorganic chemistry, qualitative analysis, and elementary organic chemistry. When the Medical School was first founded it attempted nothing but the education of men to become physicians. It now offers both instruction for practitioners and advanced instruction in the science of medicine.

The programme of study in the Medical School is so arranged that the first three years are devoted to prescribed work and the fourth year is entirely elective. The first half of the first year is devoted to Anatomy and Histology, and the second half to Physiology and Biological Chemistry. The first half of the second year is devoted to Pathology and Bacteriology, and the remainder of the second year to Hygiene, Materia Medica and Therapeutics, Theory and Practice of Physic, and to Clinical Medicine and Surgery, in preparation for the clinical work of the third and fourth years.

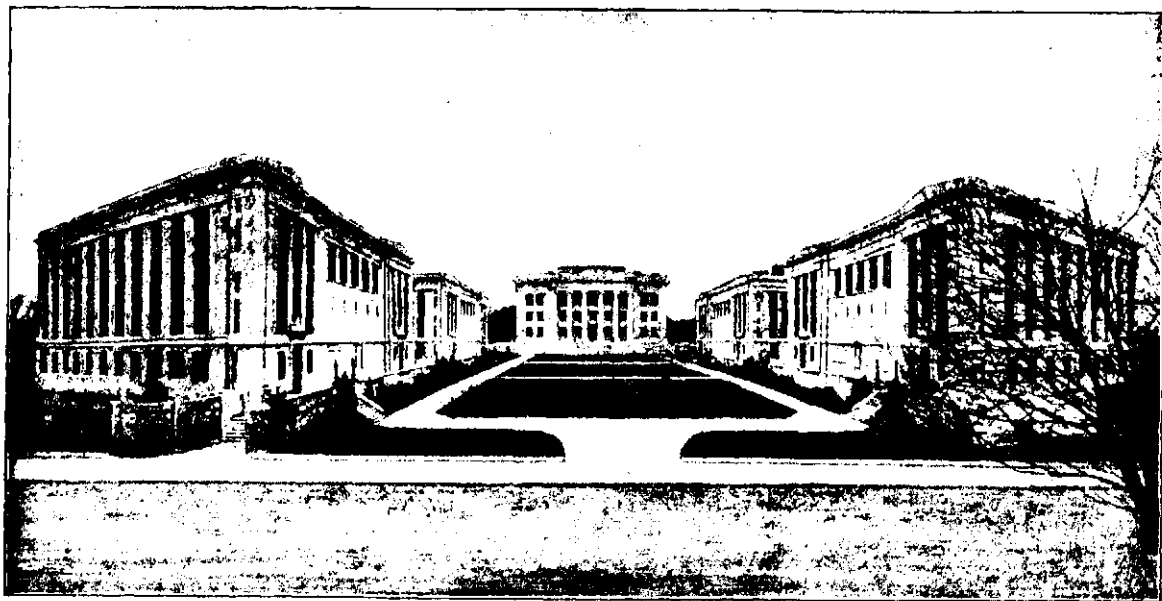
In the third year the following studies are pursued: Materia Medica and Therapeutics, Theory and Practice of Physic, Clinical Medicine, Pediatrics, Surgery, Clinical Surgery, Obstetrics, Gynaecology, Dermatology, Syphilis, Neurology, Psychiatry, Ophthalmology, Otology, Laryngology, Genito-urinary Surgery, Legal Medicine, and Municipal Sanitation.

The programme of the fourth year is composed entirely of elective courses, in the choice of which the student is guided by his wishes to become a general practitioner or specialist in some line of medicine or surgery. The electives of the fourth year are given as half-courses. A half-course may occupy the entire day for one month, the so-called all-day plan; or the forenoons or afternoons for two months, the so-called half-day plan.

The departments of Neuropathology, Clinical Medicine, Pediatrics, Surgery, and Obstetrics offer electives on the all-day plan.

The departments of Anatomy, Histology, Embryology, Bacteriology, Clinical Surgical Pathology, Genito-urinary Surgery, Orthopedics, Surgical Pathology, Gynaecology, Dermatology, Neurology and Psychiatry, Ophthalmology, Otology, and Laryngology offer electives on the half-day plan.

The departments of Physiology, Comparative Physiology, Biochemistry, Bacteriology, Pathology, Hygiene, and Theory and Practice of Physic offer electives on both plans.



HARVARD MEDICAL SCHOOL

The particular features of this course of study are the intensive or concentration system of study and the fourth-year electives. For a large part of the first three years a student concentrates his energies on only a few subjects at a time. As an example, anatomy occupies the forenoons of four months, and histology and embryology the corresponding afternoons. With this method no time is lost in changing mind and body at frequent intervals from one subject to another, and continuity of thought is easily maintained. In the fourth year great freedom of choice is allowed. Each course occupies one month, and a student may select both his subjects and the number of months in each. Throughout the course the teaching is essentially practical. The student is taught to observe for himself, to deduce his facts, and to correlate his observations, whether they be made in the laboratory or in the clinic, on animal or man, with the dead or the living. Lecture and recitation are relied upon to supplement, not to replace, the student's individual observations. The instruction staff is so large that much of the work is done in sections of three to nine students, under the direct supervision of an instructor. Training in methods is an essential of this mode of instruction. Medicine is taught as a biologic science, and methods of individual observation are insisted upon equally in the laboratory and in the clinic.

In addition to the regular course leading to the degree of Doctor of Medicine, the School maintains a Graduate Department. In

Graduate Department almost all of the departments of the Medical School there are opportunities offered to qualified men to carry on investigation in medical subjects. A man who has a reasonable problem which he desires to work out is gladly welcomed and given every assistance in the laboratories and clinics. Men desirous of training in methods of investigation will be received and their work supervised. There are also numerous courses open only to holders of the M.D. degree, which are in the main attended by doctors established in the practice of their profession who wish to pursue further some special line of work, or to become familiar with the more recent developments in medicine or surgery. The students in this department are from all parts of the country, the 82 students in attendance last year being graduates of 32 different medical schools.

The Medical School maintains a Summer School also, which is open only to holders of the degree of Doctor of Medicine, or to advanced students in some medical school. The majority of students in the Summer School, like all the students in the Graduate School, are already holders of the doctor's degree. Last year, out of 135 students, 76 were doctors, representing 47 medical schools.

In addition to the library in the main building and the several departmental libraries, the students in the Medical School have access to the Boston Medical Library, which is situated on the Fenway, not far from the Medical School. This library is large, well selected, and particularly rich in periodicals, past and current.

There are 22 scholarships in the School, aggregating \$4,500. These scholarships are chiefly assigned to students after their first year of residence. Besides these scholarships there are three fellowships of \$225 each, and six teaching fellowships of \$500 each.

In the Administration Building there is a student's reading and meeting room, where students may comfortably spend the time between hours of work. A number of student societies, organized for various purposes, add a social touch to the life of the medical student. At the Medical School or at the Medical Library numerous medical meetings are held during the year, at which the student may hear the more recent problems of medicine authoritatively discussed, while in some of the student societies the students themselves actively participate in similar discussions.

Inquiries should be addressed to the Secretary of the Harvard Medical School, Longwood Avenue, Boston, Mass.

Within the last academic year the Dental School has become more closely affiliated with the Medical School, and has begun the construction of a new building for laboratory and clinical work, next the Medical School Buildings, on the corner of Wigglesworth Street and Longwood Avenue. This building will be ready for occupancy at the opening of the next session and will furnish the Dental School with a satisfactory equipment for all phases of dental instruction. Inquiries should be addressed to the Dean of the Harvard Dental School, Longwood Avenue, Boston.

GRADUATE SCHOOL OF ARTS AND SCIENCES

DURING the first two years of President Eliot's administration (1869-71) the number of elective courses was almost doubled, and there gathered in the University a small body of resident graduate students attracted by this opportunity for advanced study. In 1872 the Corporation and Overseers of the University voted to establish the degree of Doctor of Philosophy for "candidates otherwise properly qualified who after taking the Bachelor's Degree shall have pursued at Harvard University for two years a course of liberal study approved by the Academic Council," the degrees of Doctor of Science on three years of study, and the degrees of Master of Arts and Master of Science based on at least one year of approved graduate study; and examinations were instituted for all four degrees. The following year three Doctors' degrees were conferred. From that time forward the Graduate Department grew rapidly in the number of courses of instruction offered and in the number of students. In the current academic year there are 400 students, of whom 75 per cent. took their first degree elsewhere, 143 colleges and universities being represented.

The School is under the control of the Faculty of Arts and Sciences, under which are also the College and the Graduate Schools of Business Administration and of Applied Science. The Divisions of this Faculty, in all of which graduate work may be done, are as follows: Semitic Languages and History; Ancient Languages (Indic Philology, Greek, and Latin); Modern Languages (English, Germanic, Romance, Celtic, Slavic Languages and Literatures, Comparative Philology and Comparative Literature); History and Political Science (History, Government, and Political Economy); Philosophy (including Social Ethics); Education; Fine Arts (History

and Principles of the Fine Arts, and Architecture, including Landscape Architecture); Music; Mathematics; Physics; Chemistry; Engineering; Forestry; Biology (Botany and Zoölogy); Geology (including Geography, Mineralogy, and Petrography); Mining and Metallurgy; and Anthropology.

It is obviously impossible, within the limits of a small pamphlet, to give a detailed description of a school having such diverse activities. But it is possible to give a general conception by exhibiting, through the work of some one department, opportunities which may be fairly regarded as characteristic of other departments, and of the School as a whole. On this plan will be here sketched the general organization of the School; the opportunities which the graduate student has of near approach to his instructor; the facilities for research; the libraries, laboratories, and museums; and the social life of the students.

The School is open to the graduate of any college or university in good standing. The administration of the School, however,

Admission and Degree regards admission to the School and candidacy for a degree as quite separate problems. Admission to the School depends on the general quality of the previous undergraduate programme. Admission to candidacy depends on this and also on the preparation in the special field in which the degree is sought. The Master's degree is based on a year of advanced study, approved by a Division and the Administrative Board, in a single field or in related fields, completed with distinction. It sometimes happens that a student of excellent general preparation wishes to pursue in the Graduate School a subject in which he has not specialized as an undergraduate. In this case he may not be prepared to enter immediately on courses sufficiently advanced to secure for him a Master's degree in one year. The Doctor's degree, on the other hand, is never given primarily on work done in regular courses, but, being a certificate of scholarly quality and attainment, and of ability in productive research, is based only in part on work done in courses, and more especially on examinations before the Division as a whole — usually oral — and on scholarly contributions in the form of theses or published papers. The minimum requirement is two years of graduate study, one of which must be passed in Cambridge. A longer time is ordinarily taken.

The School had its origin in the elective system, which was early developed at Harvard, and still finds there its great strength.

Courses of Instruction There are under the Faculty of Arts and Sciences 551 courses, of which 305 are whole courses, each of which is designed to occupy from a fifth to a quarter of the student's time for the entire year, and 246 half-courses. The courses in each department are divided into three groups, called respectively, "Primarily for Undergraduates," "For Graduates and Undergraduates," and "Primarily for Graduates." In the first group there are 113 courses, in the middle group 228 courses, and in the third 210 courses.

Of almost prime interest to a student looking forward to graduate instruction is the opportunity for intimate association with advanced workers and for personal relations with his instructors. Opportunities of this nature exist in all departments; they may be illustrated by the Department of the Classics.

In this Department there are 7 professors, 4 assistant professors, and 4 instructors. The number of courses in the Department of the Classics is 47, of which 14 are in the first group, 13 in the second, and 20 in the third. In the first group of courses (which do not concern graduate students because designed primarily for undergraduates) the average number in a class is 30; in the middle group, for graduates and undergraduates, the average is 24; while in the upper group, primarily for graduates, the average is 7. The average number of students in the middle group is large because of a single course which is taken mainly by undergraduate students. With that course left out of account the average number of students per course in the middle group is 14. The graduate student is thus throughout practically all of his work in small classes and in close contact with his instructors. But it is in the Seminary, in the Classical Conference, and in the Classical Club that the more intimate personal relations are established.

The Seminary is listed as one of the regular courses given by the Department, and is required of every candidate for the Doctor's degree. It meets twice a week, dividing its time equally between work in Latin and in Greek, one professor from each Department being in charge of the work on alternate days. The main work of the Seminary is interpretation and text criticism. No student

is admitted to the Seminary without having attended what is called a Proseminary, a preparatory half-course, in which instruction is given on the principles of text criticism, with illustrations from various classical authors. In the Seminary proper the year is devoted to the reading and minute discussion of one author in Latin and one in Greek, conducted by members of the Seminary in turn, each of whom is also required to write a dissertation on some phase of the work.

The Classical Conference meets once a month; and all professors, instructors, and graduate students, in the Department are expected to attend. At each meeting three papers are presented, occupying ten minutes each, and each paper is followed by a discussion. Usually two of the papers are by members of the teaching staff and one by a graduate student, although the proportion may be reversed. These papers present the results of some original investigation. The Conference, like the Seminary, is in charge of one of the professors of the Division acting as President, who explains in a few words the subject of the paper to be presented, controls the length of the paper and guides the subsequent discussion.

The Classical Club is a student organization with student officers. The Secretary is a man of experience in graduate work, and of at least second-year standing in the School, and is in charge of the arrangements for the meetings. There are in general two kinds of meetings: one in which an instructor makes an address, and one in which students make and discuss translations from some author chosen for the year. At these meetings instructors are often in attendance, though not with the regularity with which they are present at the Conference. The meetings of the Classical Club are largely social and are held in the evening in the living room of Conant Hall, the graduate dormitory. After the regular meeting of the Club, refreshments are served. The event of the year, in the Club life, is the annual dinner at some hotel in Boston, a dinner attended by most of the teaching staff of the Department.

Equivalent organizations exist in the other departments. In the Division of Modern Languages there are 16 professors, 7 assistant professors, and 24 instructors; there are 123 courses of instruction, of which 35 are in the first group, 35 in the middle group, with an average membership of 34, and 53 in the upper

group, with an average membership of 7. A Modern Language Conference unites the different linguistic and literary interests of the Division, and there are several clubs varying in organization and operation — Deutscher Verein, Cercle Français, Sociedad Española, and the Italian Club.

The most important material equipment from the standpoint of a graduate student in Arts and Sciences is, of course, the University Library. The Harvard Library, with its

Library

branches, has not far from 800,000 bound volumes, and in this country is exceeded only by the Congressional Library and two public libraries. It has the merit of including few unnecessary duplicates and few works of ephemeral interest. It is primarily a place for study and research, and only secondarily for general reading. Besides the central library in Gore Hall, the Law, Divinity, and Medical Libraries are at the Schools, and in addition there are some twenty-eight special reference libraries for the use of the various departments. Some of these reference libraries are the centre of activity in the buildings devoted to their respective departments, for example, the Philosophical Library, or that of Social Ethics, or of Architecture; others are in the various laboratories, and, although not the centre of activity, are nevertheless easily accessible to investigators; others, in being separated from the main collection, are intended for the use of students in advanced courses, and afford the quiet and retirement of a private library. Other special libraries are designed for the use of students in large elementary classes, and relieve the administration of the main collection. The Library is administered in the most liberal manner in all its departments, and its books are made as accessible as possible, especially to graduate students engaged in research. To investigators admission to the shelves is freely given.

The College Library, in Gore Hall, contains about 480,000 volumes, 330,000 pamphlets, and 25,000 sheets of maps. It has many unique collections on special subjects. The nature of the Library may be illustrated by its service to one Division, — the one which is perhaps more dependent on the resources of a library than any other, — the Division of History and Political Science. The Library is rich in materials for the study of history and economics, especially in regard to America, England, Germany, France,

Modern Italy, the Slavic countries, the Ottoman Empire, the Crusades, North Africa, China, and the Dutch East Indies. In addition to the ordinary authorities and periodical literature relating to these countries, it contains such collections as the Publications for the Record Commission, the Rolls Series and Calendars, the Documents Inédits, and the Monumenta Germaniae Historica. It is especially rich in early Americana, Colonial Records, Papers of State Constitutional Conventions, Revolutionary Tracts, and Publications of Historical Societies; it possesses a nearly complete set of United States Documents, the English official publications relating to America, the Sparks Collection and other collections of manuscripts, and an extensive collection of early maps, especially of America in the sixteenth, seventeenth, and eighteenth centuries, and of Europe in the eighteenth century. The Hohenzollern Collection of German History, one of the largest of its kind in the world, has as its nucleus the library of the late Konrad von Maurer of Munich; it comprises about 15,000 volumes, and contains an almost complete set of the local historical periodicals of Germany, and the "Urkundenbücher." The collection on French history is almost as large. The Ottoman Collection, which also ranks among the very first of its kind, centres about the library of the late Count Riant, which was given to the College in 1899. The special collection of the Crusades is from the same source.

The Library also contains a complete set of the British Parliamentary Papers since 1830, an almost complete set of the stenographic reports of the meetings of the Reichstag and the various local legislative assemblies of Germany, and a set of the recent proceedings of the Douma. Of the Library's collections on subjects not strictly historical, but closely related to history, that on Folk-Lore deserves particular mention. The resources for the student of history are greatly increased by libraries in the vicinity. The Boston Public Library is the second in size in the United States, and in history, which is here being taken as an example, is particularly strong in Americana. The Boston Athenaeum has a notable collection of Washingtoniana; it is also strong in international law and receives regularly the British Blue books, the French Yellow books, the German White books, and other foreign official publications of the kind. The Massachusetts State Library is especially strong in foreign law, and the Library of the

Massachusetts Historical Society is rich in local history. The John Carter Brown Library of Brown University in Providence possesses a splendid collection of early Americana, is generous with its facilities, and so near as to be easily accessible to students engaged in research.

The laboratory of the Division of Physics may be taken as fairly typical of the many laboratories under the Faculty of Arts and Sciences. It is a four-story building, 60 by 200 feet.

Laboratories

The main walls and the partition walls are of solid brick with brick surfaces for the interior walls of the rooms. The more elementary courses of instruction and the advanced research courses are separated. At the east end of the building is a lecture room with a seating capacity of three hundred; a large laboratory 60 by 60 feet, and cabinets for apparatus. The west end of the building is free from iron in its construction and in many ways specially adapted to research work — pier tables on the ground and second floors, with foundations independent of the rest of the building, an interior tower 80 feet high, the foundation separate from the building and protected from winds by the surrounding building, and the constant-temperature room at some depth underground in the centre of this tower. In the basement under the eastern wing is a power and small dynamo room, a machine shop, a room for glass blowing, and a carpenter's shop. These rooms are in charge of two mechanics, a glass blower, and a carpenter, all experts in their respective lines. By the growth of the research activities of the laboratory the cabinets of apparatus have been crowded into smaller and smaller space. This has been done with regret as they contain a number of interesting historical pieces, gathered during the past one hundred and fifty years. The laboratory has an endowment of over \$140,000, in three separate funds. The income of this endowment, together with an appropriation from the general University funds and what is received from laboratory fees, gives the laboratory an income for maintenance of over \$11,500 annually, aside from the salaries of the teaching staff. By far the larger part of this income is expended on research. Besides the general fellowships and scholarships in which the Division shares, there are four special fellowships at the disposal of the Division for graduate students engaged in research, and a post-doctorate fellowship for research.

Of the several museums in the University, — the Fogg Art Museum, the Germanic Museum, the Semitic Museum, and others,

— by far the largest is the University Museum.

Museums In it are combined the Museum of Comparative Zoölogy, the Botanical Museum (except the Gray Herbarium, which is housed separately), the Mineralogical Museum, the Geological Museum, and the Peabody Museum of American Archaeology and Ethnology. As a whole and in many of its component parts it ranks with the great government museums of Europe and America. It had its start in the collections which Louis Agassiz began privately even before he came to Harvard in 1847. These collections were transferred to the College in 1852, and continued to grow under Professor Agassiz's enthusiastic administration. After they had been inadequately housed for many years, Professor Agassiz, in 1857, sketched a general plan closely approximating the present University Museum, and two years later the foundations of the north wing — the part now designated as the Museum of Comparative Zoölogy — were laid. It is interesting that at this early date, when museums of any sort were few and small, Louis Agassiz's conception so nearly anticipated the present structure, which has a floor area of over seven acres, and includes within its walls the museums of all the departments of Natural History, their exhibition rooms, research rooms, laboratories, libraries and lecture-rooms, — a great teaching museum. It is as an educational institution that the Museum is of special importance.

The zoölogical collections in the Museum, open to the public, are in five parts. Just within the main entrance is a synoptic room, no longer a unique feature in museum arrangement, in which is a small collection containing representatives of the several groups of animals. On the floors above the main exhibits are arranged on two different bases. In one part both living and fossil animals are grouped according to their systematic relations to one another; in the other the faunistic regions of the earth and sea each have their characteristic living animals brought together, separate rooms being devoted to each of the following regions: the North American, the Europeo-Siberian, the Indo-Asiatic, the African, the Australian, the South American, the Atlantic and the Pacific. Other rooms are devoted to collections illustrating various biological conditions

of interest and importance, such as the nesting habits of birds, albinism, dimorphism, and the effects of breeding experiments. Finally on the first floor adjacent to the synoptic collection are separate rooms devoted to the exhibition of fossils of the palaeozoic, mesozoic, and caenozoic ages. This public exhibit occupies the greater part of three floors of the north wing and the adjoining rooms of the central section. The working collections, for purposes of research and record, are much larger than those open to the public. They are exceptionally extensive in fishes, both recent and fossil, and in invertebrates, including fossil crinoids, trilobites, and cephalopods. The Entomological collection is especially noteworthy, both because of its size and its richness in types. It is very rich in Neuroptera, Diptera, and Coleoptera. These storage rooms are so arranged as to make them convenient for specialists working on the various collections.

The library, which contains more than 44,000 volumes on zoölogy and geology, is accessible to advanced students and investigators.

That portion of the Botanical section of the Museum which is open to the public includes an interesting exhibit illustrating economic botany, and an extensive series of models of living plants. In the basement of this part of the Museum is stored a large collection of fossil plants. In the same section are also located the extensive collections in cryptogamic botany, algae, fungi, lichens, mosses, and hepatics. But the Gray Herbarium, which is rich in type specimens of species and varieties, in standard and rare phaenogamic *exsiccati*, and in the possession of the greater part of the specimens which were critically studied by Asa Gray in his preparation of the "Synoptical Flora of North America," is at the Botanic Garden, some three quarters of a mile from the University Museum. Additional facilities for botanical work are afforded by the Bussey Institution and the Arnold Arboretum at Jamaica Plain.

The Mineralogical Museum occupies the south central section of the Museum. The two upper floors contain the public exhibits, comprising about ten thousand specimens arranged to illustrate systematic mineralogy and the physical properties of minerals and crystals and their occurrence. The storage collection of minerals and rocks is exceedingly large.

The Geological Department, with exhibition rooms connecting with the Mineralogical section, occupies the southwest part of the Museum. In this section are included the geographical and meteorological laboratories with rooms for physiography and climatology.

The Peabody Museum of American Archaeology and Ethnology occupies the south wing of the Museum. This valuable collection, whose start is due to the persistence and industry of Jeffries Wyman, is antedated only by the Smithsonian Institution, and is one of the few large museums on the subject in this country.

In all the sections of the University Museum, the lecture rooms, laboratories and libraries of the corresponding departments are conveniently located in proximity to the collections, and are open freely to students and investigators.

The social life of the students in the Graduate School of Arts and Sciences has been especially pleasant since Conant Hall, one of the best appointed of the University dormitories, has been reserved for their exclusive use. The Graduate Club, after twenty years of independent activity, has combined with the Conant Hall Association, for the holding of joint meetings in the living room of the Hall. These evening meetings, held every two weeks, are addressed by eminent scholars; they also provide an opportunity for agreeable social intercourse.

Inquiries in regard to the School should be addressed to the Secretary of the Graduate School of Arts and Sciences, University Hall, Cambridge.

GRADUATE SCHOOL OF BUSINESS ADMINISTRATION

IN March, 1908, the Governing Boards of the University established a Graduate School of Business Administration, "the ordinary requirement for admission to which shall be the possession of a bachelor's degree, and for graduation a course of study covering two years." They have thereby practically completed the organization of professional education in Harvard University, since, like the other Harvard professional schools, the new School is to rest as a graduate department on the basis of a broad and liberal education. Furthermore, by undertaking to give specialized instruction leading up to a business career, they have recognized in the amplest manner the claim of modern business to be regarded as a profession, equally with the applied sciences, medicine, law, or divinity.

The School offers preparation for those branches of business in which a professional training may now suitably be given, such as transportation, banking, insurance, accounting and auditing. The two years of graduate study, based upon the preliminary college course, comprise a series of new courses in general subjects, commercial law, economic resources, industrial organization, and principles of accounting, followed by the more specialized courses leading directly to the business for which the student is fitting. While efficient training for business is the service to the community which Harvard chiefly designs in the foundation of the School, the instruction given provides also, in certain directions, for those who aim to enter the Government service.

While the needs of certain specialized lines of business are kept prominently in view, the student planning for other activities in commerce or manufacturing is not neglected. In addition to the more general courses already indicated, especial attention will be given to the development of the work in business

organization and system. Instruction in this branch, particularly in the second year, may be readily adapted to meet individual requirements. The courses in the School may, furthermore, be supplemented, where advisable, by a wide range of electives in the other departments of the University.

Unlike the other professions, with their well-established University instruction and tried methods, Business, as a department of University training, has still, to a large extent, to invent its appropriate means of instruction and to form its own traditions. From the mass of accumulating business experience, a science must be quarried. Not only must the fundamental principles guiding conservative business be elucidated, but the art of applying those principles in the various fields of enterprise must be taught in a scientific spirit. To this end there is introduced in the School, wherever practicable, a "problem method" of instruction. The method of instruction, seeking to meet individual needs, will facilitate that closer personal relation between teacher and student, so essential to the best work of both. Students will be brought into touch not only with the professional spirit characteristic of the graduate schools but with business men and, so far as possible, with actual business conditions.

The School, as at present organized, is primarily designed for those aiming to fit themselves for the ultimate attainment of posts of responsibility and leadership in the business world. This does not mean that there is any expectation of turning out captains of industry ready-made. The graduates of the School must be prepared to commence at the bottom of the ladder, and, though trained men, to accept such positions as are open to the untrained beginner. But it is confidently believed that, given the indispensable business ability,— which cannot be taught, — the professional training of the School, united with the broader outlook on business affairs which it should impart, will make probable a more rapid advancement.

A pamphlet containing a description of the courses may be obtained on application. Inquiries concerning the School should be addressed to the Dean of the Graduate School of Business Administration, 17 University Hall, Cambridge, Mass.

GRADUATE SCHOOL OF APPLIED SCIENCE

IN 1847 the Corporation and Overseers announced the intention of giving graduate instruction in applied science. The following year, in recognition of a generous gift from the

History Honorable Abbott Lawrence, the School thus established was called the Lawrence Scientific School. At first the students in the School were all holders of a bachelor's degree or men of maturity. In the course of time, however, the character of the students in the School changed and it became an undergraduate technical school of the usual type. In the winter of 1905-06 it became evident that the very generous bequest of Mr. Gordon McKay, amounting to about five million dollars, would ultimately become available for the work in applied science in the University. In March, 1906, the Graduate School of Applied Science was established, and in November, 1907, the Lawrence Scientific School was closed to the further admission of students. Hereafter a student coming to Harvard University for work in applied science either will come equipped with a bachelor's degree and enter directly the Graduate School of Applied Science, or he will enter Harvard College, there to pursue work in mathematics, pure science, modern languages, and a certain amount of introductory work, such as drawing, descriptive geometry, surveying, and even more technical subjects, and work in history, government, economics, and those subjects which to a professional man are part of a liberal education. On graduation he will be qualified to enter the Graduate School of Applied Science as a candidate for a professional degree.

The Graduate School of Applied Science offers courses leading to professional degrees in the following subjects: Civil, Mechanical,

General Statement and Electrical Engineering, Mining and Metallurgy, Architecture and Landscape Architecture, Forestry, Applied Physics, Applied Chemistry, Applied Biology, and Applied Geology. Admission to the School is open to holders of the bach-

elor's degree from any college or scientific school in good standing. In order to be recommended for the degree a student must have completed his work with high credit, and must have satisfied the department in which he is working in regard to his professional attainments. It is evident that students coming from other institutions will have a very varied preparation, and probably this will be true also in large measure of students who have graduated from Harvard College under the elective system. In order to afford some opportunity for them to bring their work into line and to advance themselves as far as possible toward their professional work, the Division of Engineering maintains a Summer Camp in which instruction is offered in those subjects in which their preparation is most likely to be deficient. Similarly the Division of Fine Arts maintains in the Summer School in Cambridge courses useful in preparation for work in Architecture and Landscape Architecture. Pamphlets describing the courses of instruction offered by the several Departments of the School will be mailed on application to the Secretary, University Hall, Cambridge.

The Division of Engineering offers courses of study leading to the degrees of Master in Civil Engineering, Master in Mechanical Engineering, and Master in Electrical Engineering. **The Division of Engineering** Its library and laboratories are located in Pierce Hall. Broadly classified there are five, — the Hydraulic Laboratory, the Laboratory for Testing Materials, the Heat Engine Laboratories, the Electrical Laboratories, and the Laboratory for General Problems in Applied Mechanics. In addition to these there are a number of smaller laboratories and research rooms for the use of professors and graduate students engaged on special problems.

The Work Shop courses are given during the summer at the Cambridge Manual Training School, where students have practical work in the blacksmith shop, the pattern shop, and the machine shop. The University does not provide such instruction in term-time, although requiring that its graduate students in certain lines of engineering shall have received such instruction.

All the instruction in surveying (including railroad and geodetic surveying) and a repetition of the instruction in some other subjects are given in the Summer at the Harvard Engineering Camp. This is situated on the slope of Red Hill on the eastern shore of

Squam Lake, New Hampshire, about five miles from Lake Winnepesaukee, and in the foothills of the White Mountains. The property consists of about seven hundred acres, owned by the **Engineering University**, so varied in topography and character **Camp** as to offer suitable practice ground for all kinds of surveying problems. It has about two miles of shore line, includes both hill and level land, and is in part open and in part heavily wooded. There are several large buildings on the tract especially adapted for administration and instruction. The draughting rooms are airy and open, and are provided with good lights for evening work. The students and instructors live in tents pitched on the shore of the lake, and meals are served on the large covered piazza. The food is simple, wholesome, and as varied as is consistent with the low charges made. Residence in the Camp is required of all students. The social life of the members is agreeable. The students work and live practically out-of-doors; and the Camp duties, although rigorous, are performed under conditions favorable to health and increased vigor. The work is continuous from seven in the morning throughout the day, for a period of eleven weeks. The course in Plane Surveying lasts six weeks; in Railroad Surveying, five weeks; and in Geodetic Surveying, three weeks. A special course in Plane Surveying, intended for men who have had only the mathematics required for admission to the College, is to be given in the Summer of 1909. This course will last nine weeks. Only two courses may be taken in one summer. The work of the Camp has been extended to include a limited number of other courses, notably in elementary mechanics, statics and kinematics, and resistance of materials, which, regularly given at Cambridge, are repeated in the summer.

The Camp is open not only to members of Harvard University, but to students from other colleges and scientific schools, and to any qualified man who desires to study practical surveying. It offers an excellent opportunity for young men to advance themselves in preparation for their more strictly technical work, if they are proposing to enter the Graduate School for work in engineering, mining, landscape architecture, or forestry. The courses given are on subjects which students entering the Graduate School are supposed to have anticipated.

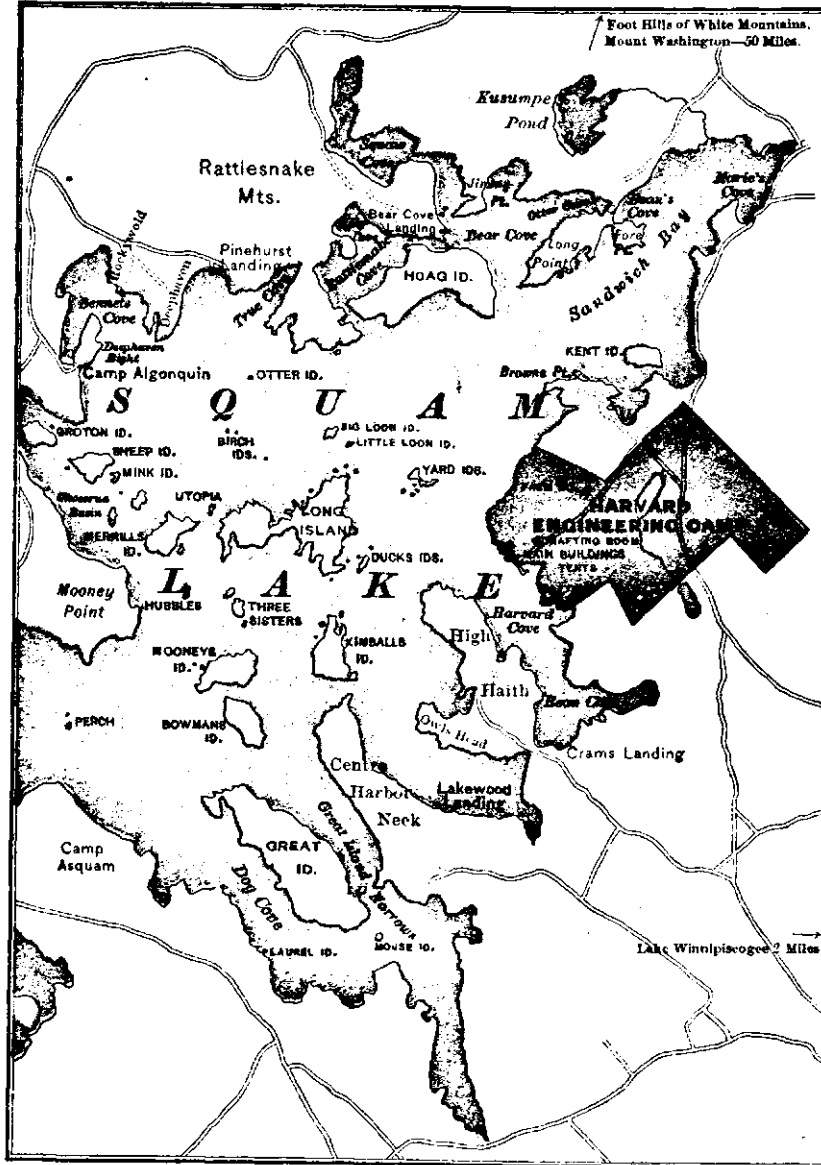
For a special pamphlet, descriptive of the courses given at the Camp, or for other information, address Professor H. J. Hughes, 114 Pierce Hall, Cambridge, Mass.

The Division of Mining and Metallurgy offers courses leading to the degree of Mining Engineer and Metallurgical Engineer. Its instruction is centred in the Rotch Building, which contains, besides the instructors' rooms, a lecture room, a library, a reading room, exhibition and storage rooms, and the following Laboratories: —

The Laboratory of Metallurgical Chemistry contains forty-eight desks, each with its own hood and sink, and the usual accessories. At the end of the room are tables for large or general apparatus, such as combustion furnaces, reductors, calorimeters, etc. The equipment of the laboratory is designed for general metallurgical analysis, which demands much hood space, facilities for rapid evaporation and filtration, and good ventilation and light. The Ore-Dressing Laboratory, extending the height of the building, is provided with modern machines of full size for the crushing, amalgamation, and concentration of ores. It contains a rock-breaker, a five-stamp battery, rolls, jigs and concentrating tanks of various kinds. In this room are also experimental plants for cyaniding and chlorination. The Assay Laboratory is equipped with nine two-muffle soft coal furnaces, a crucible furnace, a power sample grinder, and all the apparatus necessary for assaying. The Metallurgical Laboratory contains blast, reverberatory, gas, and electric furnaces with accessories for the treatment of iron and steel, such as melting, annealing, hardening, tempering, case hardening, malleablizing, etc., and for the melting and making of alloys, and the apparatus necessary for the treatment and testing of the products. All heat work, the measurement of high temperatures, and the preparation of samples for analysis and of metallic specimens for optical investigation are carried on in this room. The Laboratory of Metallography is equipped for the microscopic examination of metals and other opaque objects and all the necessary facilities for photomicrography.

A large amount of work is required during the vacations. A knowledge of surveying is presupposed of graduate students in mining. Unless anticipated elsewhere this can be secured best

Foot Hills of White Mountains.
Mount Washington—50 Miles.



HARVARD UNIVERSITY: LAND AT SQUAM LAKE, N. H., FOR WORK IN SURVEYING, ROAD AND RAILROAD ENGINEERING, ETC., THE SUMMER ENGINEERING CAMP, 500 ACRES

at the summer Engineering Camp at Squam Lake. In the summer vacation a class, under the guidance of an instructor, visits **Summer Work** some mining district, and spends from eight to **in Mining** ten hours a day in observing the working of mines, underground, and on the surface. In past years the principal districts of Colorado and Utah, of Lake Superior, the Adirondacks, New Jersey, Pennsylvania, and the Southern States have been visited. Arrangements have just been completed whereby the Division of Mining will hereafter have the use, during the summer months, of the upper levels of a copper mine in Orange County, Vermont. The work there will last eight weeks, the class being divided into four squads which will perform in rotation the practical work of surveying, sinking, drifting, and stoping. The squads engaged on the last three jobs will be in charge of practical miners. The students will drill holes, blast, clean up, timber, lay track, and perform all the operations of actual mining.

The Department of Architecture offers courses leading to the degree of Master in Architecture. In Robinson Hall the Department of Architecture has one of the best equipped buildings in the College Yard. The front entrance of the building opens into a Hall of Casts two stories in height, in which are full sized casts of important pieces of architecture. These include the order of the Temple of Theseus and of one corner of the Temple of Niké Apteros at Athens, the orders of the Mausoleum at Halikarnassus and of the Temple of Vesta at Tivoli, the entablature of the Temple of Concord in Rome, a large part of the arch of Trajan in Beneventum, several important Roman and Renaissance doorways, the balcony and window of the Cancelleria palace in Rome, besides statues, vases, cornices, and other smaller objects. The collections include also a remarkably fine series of casts from Greek architectural detail, made for the Department in Athens, and including several casts from objects not hitherto reproduced; and an interesting series of original fragments, chiefly marble, of Greek, Roman, and Italian Renaissance detail.

On the first floor are two lecture rooms, of which the smaller is surrounded with blackboards for blackboard drill, and the larger has on its walls a valuable collection of oriental embroideries, tex-

tiles, and prints, and paintings and drawings of artistic significance. On the same floor is a room for free-hand drawing, containing casts mainly of mediæval architecture, and having on its walls oil and water-color paintings of architectural subjects, and original architectural drawings by such masters as J. M. W. Turner, Samuel Prout, J. D. Harding, David Cox, and S. J. Cotman. There are also on this floor a smaller drawing room with casts, mainly of Greek, Roman and Renaissance art, and a collection of pottery and bronze ware as examples of design and color. In another room there is an exhibition of building materials, and models illustrating construction.

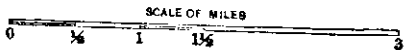
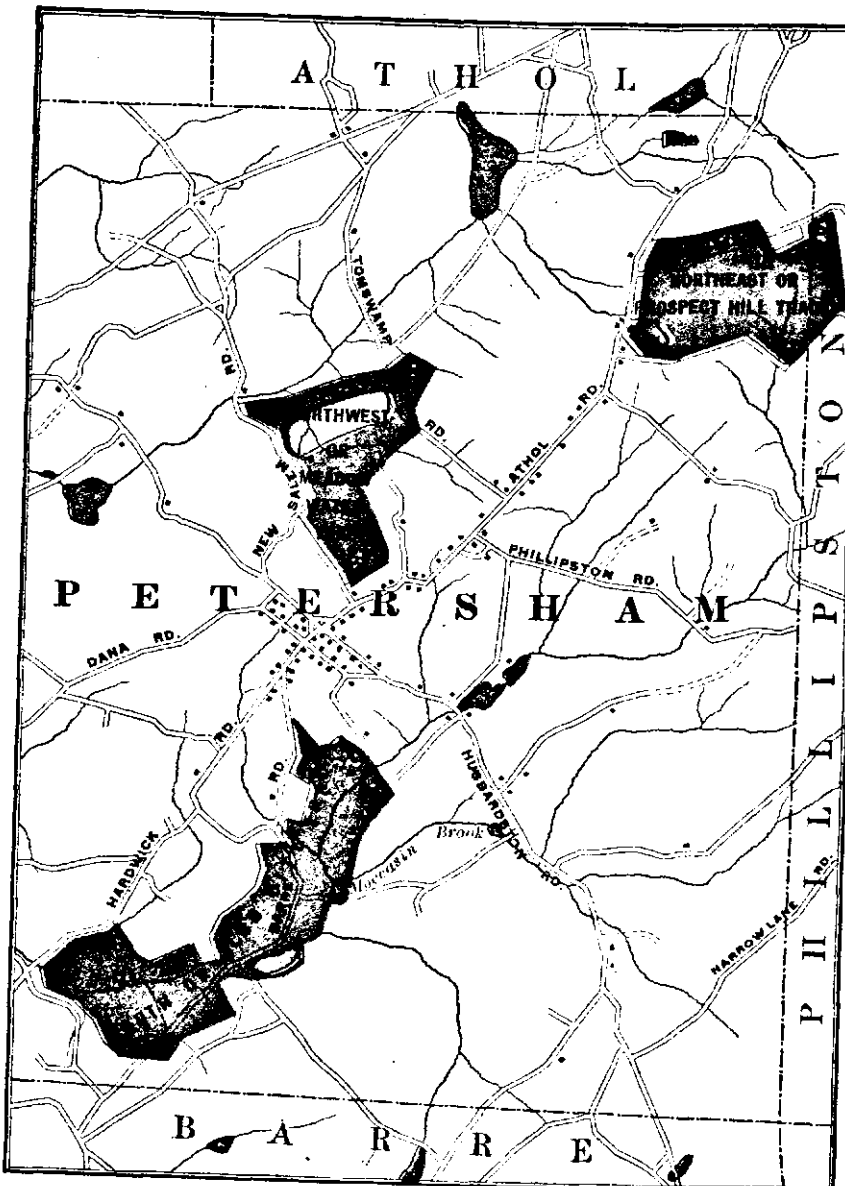
On the second floor is the main drawing room, extending the length of the building and of approximately half its breadth. Opposite one end of the drawing room is a smaller drawing room; opposite the other end is the library.

The basement contains rooms for clay modelling, for photographing, for unpacking and for mounting, and for storage.

In addition to the collections of the Department, those of the Fine Arts Department in the Fogg Art Museum of the University, of German work in the Germanic Museum, and of Assyrian, Persian, and Roman work in the Semitic Museum, are available and are freely open to students.

The library of the Department is intended essentially as a reference library, and contains, besides a collection of over 11,000 photographs, all the works referred to in the courses on architectural history, and in the lectures on the theory of design; but most of the books have been chosen with regard to the work of the drawing room, and especially to facilitate the practical work in design. The plates of many of the volumes have been taken from their bindings and mounted on separate cards like photographs, and are conveniently catalogued and arranged in cases. Large tables are provided for the convenient examination of the books and photographs, and for tracing. The library now contains 1,191 bound volumes, besides 243 portfolios containing mounted plates.

The University Library at Gore Hall contains a collection of books on Architecture, Landscape Architecture, and the other Fine Arts, numbering over 12,000 volumes.



PETER ERDMAN, BOSTON

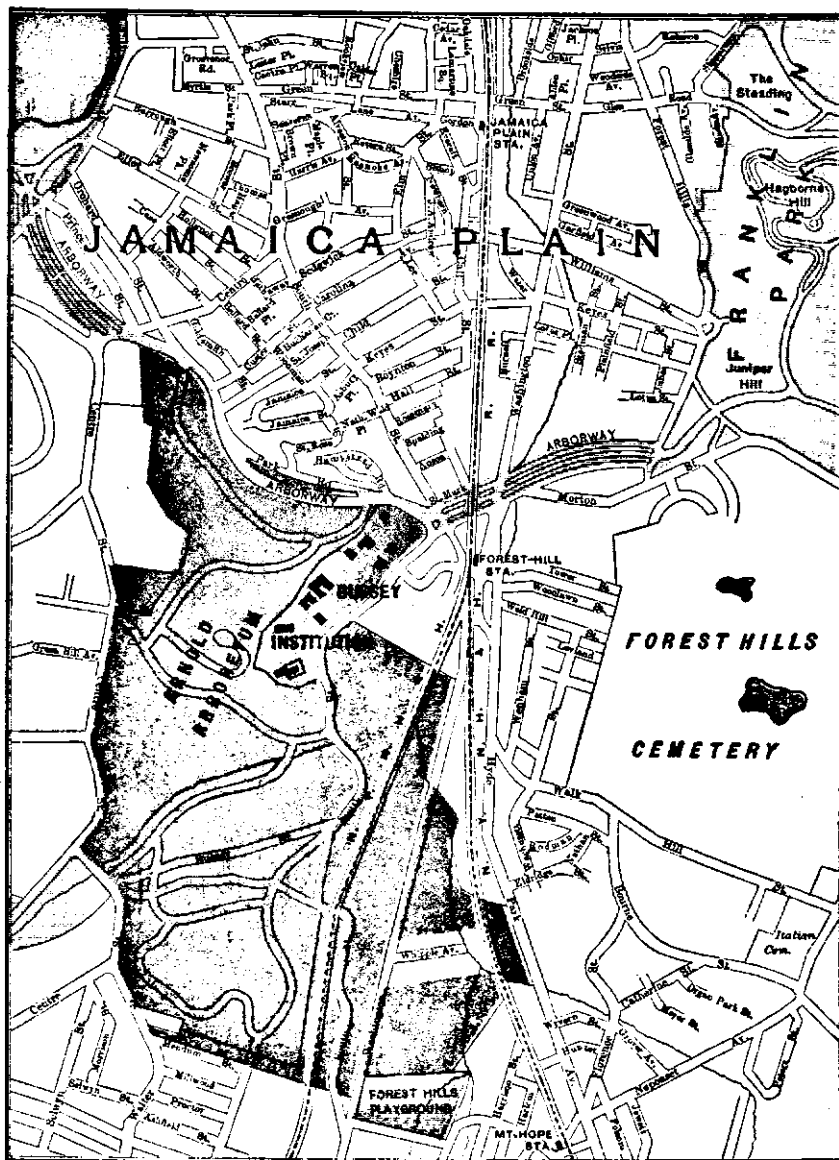
HARVARD UNIVERSITY: HARVARD FOREST, PETERSHAM, MASS., 2,000 ACRES

Landscape Architecture is treated as an art of design closely related in many ways to Architecture, but involving many independent problems. Direct instruction in landscape Architecture design, which forms the main body of the course, is given in Robinson Hall. This is necessarily based on a knowledge of topographical surveying, botany, geology, horticulture, arboriculture, and forestry. The equipment of the University for instruction in these subjects is exceptional, including the Engineering Camp at Squam Lake, the University Museum, the Botanic Garden, the Bussey Institution, the Arnold Arboretum, and the Harvard Forest at Petersham. The Department makes considerable use of many notable examples of Landscape Architecture in and near Boston. Many private estates are open through the courtesy of their owners to the students of the Department; and some of the more advanced problems are based on topographical maps of portions of the Metropolitan Park System.

The Division of Forestry offers graduate courses leading to the degree of Master in Forestry. The gift, last Fall, of two thousand acres of unusually fine forest lands in the neighborhood of Petersham, eighty-five miles west of Cambridge, will result in a reorganization of the work of the Division of Forestry. It is probable that each of the two years of which the graduate course is composed will be divided hereafter into three terms. Of these the Fall and Spring terms of the first year will be spent in the Forest in the study of silviculture, forest measurement, forest botany, forest protection, and management. The Fall term of the second year will be spent at Petersham. January will be spent on some large commercial tract in the study of lumbering, mill work, land-ownership, and forest management. The Spring term of the second year will be spent in part at Petersham, in part on some large commercial tract, in the preparation of a survey, timber estimate, and valuation, and in the preparation of a map. The greater part of the technical study, involving reading and class-room work, will take place at Cambridge during the winter terms. Important adjuncts to this instruction are the University Museum and the Arnold Arboretum, described elsewhere in this pamphlet.

The Harvard Forest comprises what is probably the best body of timber to be found on an equal area in Massachusetts. There are ten million board feet of merchantable lumber at present standing on the tract, nine-tenths of it white pine. This fine stand, however, occupies only about half the total area, the rest of which is covered by various types of hard-wood growth, younger crops of pine, and some open ground. The lay of the land, the features of which are a stretch of three miles of the Swift River valley, the basins of two ponds, and the slopes of the well known Prospect Hill, makes the forest cover peculiarly rich and interesting, and some fifteen miles of good wood roads provide access to all parts of the tract. Several buildings afford lodgings both for students and instructors and for the managing force. The greatest advantage, however, from the point of view both of forestry instruction and of practical lumbering, lies in the arrangement of the age-groups or generations of timber. It so happens that stands of various ages, from the small sapling to the mature tree, are almost equally represented on separate areas. This, taken with the ready accessibility and saleability of the timber, constitutes a unique opportunity for the successful practice of forestry. An approach to a continuous yield can be secured without cutting more than a small proportion of the whole area in any one year, and little by little the forest can be so organized as to offer an increasingly valuable demonstration of practical and scientific management.

The Departments of Physics, Chemistry, Zoölogy, and Geology offer courses leading to the degree of Master of Science with designation of field. The work leading to these degrees is not closely prescribed, but includes courses in both pure and applied science. The work in each of these departments may be directed in any one of several channels, the particular direction being shown largely by the special research work pursued in the second year. In the Department of Zoölogy, for example, a student will be recommended for the degree of Master of Science in Zoölogy who, having completed the necessary preparation, has devoted not less than two years to advanced Zoölogy, and has given evidence of high attainment in his studies. At least half of the work of each year



PETERS ENGINE, BOSTON

SCALE OF FEET

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HARVARD UNIVERSITY: BUSSEY INSTITUTION AND ARNOLD ARBORETUM, 394 ACRES

must be devoted to research in applied zoölogy in the courses known as Zoölogy 20. Should such a subject as heredity be chosen, the research work would include a study of the Mendelian laws, and of the varied problems involved in their application. The equipment of the University is not such as to enable it to undertake the more practical processes of breeding domestic animals, but on the other hand its facilities are excellent for the investigation of those scientific problems which are involved in all animal breeding, which are fundamental to it, and the understanding of which, still rare, is of the greatest practical value.

The Bussey Institution and the Arnold Arboretum are a highly valuable part of the equipment of the University in biology. They are both located on an estate of three hundred and ninety-four acres within the city limits of Boston. Of this two hundred and twenty acres are devoted to an arboretum, liberally endowed by James Arnold, which is a great museum of trees and shrubs suited to the climate of Massachusetts, and devoted to experiments in arboriculture, forestry, and dendrology. The living collections are supplemented by an herbarium, a museum, and a library, in a building near the entrance to the estate from the city parkway. The remainder of the land belonging to the University is devoted to instruction and investigation in agriculture and horticulture, for which an endowment was left by Benjamin Bussey, with particular reference to heredity and economic entomology. The Bussey Institution is thus the laboratory of certain branches of applied biology. Its teaching and research staff is a part of the Division of Biology in the University, and its students are students in the Graduate School. Beside the main building, which is used for laboratories, and the greenhouse, there are on this part of the property farm buildings and the state laboratory for the preparation of antitoxine serum.

Inquiries in regard to the School should be addressed to the Secretary of the Graduate School of Applied Science, 16 University Hall, Cambridge, Mass.

THE PROPOSED PROVINCIAL RESIDENTIAL COLLEGE FOR BENGAL.

THE question of having a first grade college for the Moslem youths of both the Provinces of Bengal, has been hanging fire for sometime past. Since the establishment of the Provincial Muhammadan Educational Conference, Bengal, this subject came up again and again before the public; but it appears that no steps were taken to formulate any definite scheme. In 1904, when this Educational Conference met for the first time at Rampur (Rajshahi), the question of a Moslem College was discussed informally, but the proposal was not adopted in the form of a resolution on the ground that the task would prove too onerous for the infant institution. In 1906, the subject cropped up again during the third sessions of the Conference held in Calcutta, but it was kept in abeyance owing to the unsettled state of opinion of the Moslem public in consequence of the Partition as it was then not known whether this Conference would be for the new Province as well. At the Purnea session of the Conference in 1907, the question of a Muhammadan College for Bengal was warmly discussed and a resolution was adopted on the subject. Selection of site for the proposed college then formed the main point of discussion and it was decided to leave the question to the choice of the Public. In the meantime, matters were coming to a head. The growing number of the Moslem students in both the Provinces of Bengal, their increasing demand for admission to the Presidency College and the refusal of their numerous applications for admission to the Presidency and other colleges brought the question prominently before the public. The necessity of a Moslem College was so keenly felt that the leading men of our community were obliged to convene a meeting at the Town Hall in 1909 when the proposal of raising the the Calcutta Madrasah to the status of a first grade college was

thoroughly discussed and a committee consisting of such gentlemen as Nawab A. F. M. Abdur Rahman, the Hon'ble Mr. Justice Sayed Sharfuldin, the Nawab Bahadur of Dacca, the late Nawab Bahadur Sayed Amir Hossain, Nawab Abdus Sabhan Chowdry, &c. &c. was formed to carry out the above project. Then followed a period of lull, and nothing practical appears to have been done although Nawab Abdur Rahman tried his best to give effect to the proposal.

In August 1910, the Central Standing Committee of this Conference addressed a letter on the subject to the Government of Bengal and the Director of Public Instruction. No reply has yet been received from the Government, but the reply received from the Director of Public Instruction is to the effect that "a very strong case would have to be presented before a proposal to this effect could be entertained and that there does not appear to be much likelihood of its being sanctioned in the immediate future on account of the prior claims for Government of other urgent educational schemes." However, the matter was not allowed to rest here. In the last sitting of the Conference held at the Town Hall in October last, a resolution was adopted for the establishment of a Moslem College by raising the Calcutta Madrasah to the status of a first grade college. This is the short genesis of the movement for a Muhammdan College in Bengal. It will be evident from the account given that the subject has been before the public for sometime past.

Since the adoption of the resolution at the last Conference, it appears that some doubt has been entertained in certain quarters as to its real significance. Several gentlemen and some officials with whom I had a talk on the subject, seem to think that the suggestions of Mr. Aftab Ahmad in his presidential speech and the idea embodied in the resolution, can not be reconciled as the Calcutta Madrasah raised to the status of a college will be a Government Institution where the policy of religious neutrality will prevail as is the case with other Government Colleges and consequently no provisions for religious instructions can possibly be made in it, nor can such a college be developed

on the lines of the M. A. O. College; Aligarh, unless it be in the hands of a board of trustees. The resolution as it stands, is silent on the point, and unless a scheme dealing with the nature and constitution of the proposed college is drawn up, a definite opinion can not be hazarded.

Now, in order to carry out this resolution, we have to direct our attention to the following points,—

- (1) Necessity of a Muhammadan College for Bengal ;
- (2) What should be its constitution and the under-lying principle on which it will be conducted ;
- (3) Sources of its maintenance.

As to the first point, it is sufficient to observe that the short history of the movement for a Muhammadan College given above, will clearly show that its necessity has long been felt; and since the enforcement of the Regulations under the new University Act, it has become an urgent need. The college department attached to the Calcutta Madrasah has been abolished and the authorities of the Presidency College with which the college classes of the Madrasah have been amalgamated, have put a limit upon the number of admissions to that College. Some of the Private Colleges have no staff for teaching Arabic and Persian and some of them have been obliged to refuse applications for admission from Moslem students owing to the prior claim of those candidates who are the " old boys " of the college. Moreover, the number of Moslem students is increasing rapidly, and every year there is an increasing demand for admission to colleges. In fact, Moslem students are experiencing great difficulty in securing admission, and we know several cases in which students have been obliged to give up their studies as they could not get timely admission to any college. Now, the situation is this—either the Mahomedans of East and West Bengal must exert themselves for the establishment of the proposed college, or they must give up the idea of spreading with facility Higher Collegiate Education in their community. Will the Moslems of the old and new provinces sit idle in apathy and indifference and remain satisfied with the second alternative, or will

they combine themselves for translating the proposal into action. Having regard to the awakening and the growing consciousness of the Mahomedans, it may safely be presumed that the second alternative cannot be acceptable to them.

Out-line of the Scheme for the Proposed College.

The second point leads us to the consideration of a scheme for the proposed college. It would have been better if some scheme had been launched before the public for their consideration. As no scheme has yet been out-lined and as the subject involves urgency, I think that it is desirable that an outline of the scheme should be laid before the public without further delay. My suggestions in this respect are as follows :—

- (a) The proposed College when established, may be called the Provincial Residential College for Bengal, consisting of a College and a School Department.
- (b) It must be a first grade college well-equipped for imparting a sound education in Oriental and Western Arts and Science.
- (c) It should be a Residential College, catholic in its character and open to all classes of students without distinction of caste and creed.
- (d) Theology should be a compulsory subject of study and the practical side of religious observances should be enforced with due care and attention according to the rites and tenets of the School to which the students would belong. The religious instructions of non-Moslem students should be entrusted to teachers and professors belonging to their sect.
- (e) The College should be in the hands of Trustees under the supervision of the Education Department, if necessary, the Government having an effective voice in its management. This suggestion is prompted by the consideration that if it be exclusively in the hand of the Government (as an ordinary Govern-

ment college), theology can not be made a compulsory subject of study in the institution, and in that case our ideal of a well-equipped Moslem College on modern lines imbued with the Islamic ideas and spirit cannot be achieved. Our chief aim is to have a Moslem College whose frame-work and constitution should be "based on the latest knowledge and experience of humanity, but its spirit and soul should be Islamic." But this is not possible in a Government college owing to its policy of Religious Neutrality. It is, therefore, desirable that the proposed college should be in the hands of trustees.

- (d) The proposed college will, no doubt, be at present affiliated with the Calcutta University, and its staff should consist of competent Indian and European professors under an efficient committee of management.
- (e) In the College, Arabic, Persian and Sanskrit should be taught as the classical language, along with English, and provisions should be made for the teaching of Urdu and Bengali as well in the school department that will be attached to the College.

Cost of its maintenance.

The third point leads us to the consideration of the means for meeting the cost of its maintenance. Looking at the statistics of costs given in the Report of the Education Department for 1909-10 for the maintenance of Government colleges, we find that the annual net cost to Government for the Patna College with 219 students on average, is Rs. 52182; for the Ravenshaw College with 211 students, Rs. 31486; for the Hooghly College with 134 students, Rs. 27699; and for the Krishnagore College with 112 students, Rs. 27321. So the annual cost of the proposed College with a probable number of 250 students on average, and the School Department attached to it with 500 pupils, may fairly be put down at Rs. 60,000 per

annum of which Rs. 40,000 will be required for the College Department and Rs. 20,000 for the School Department, the latter amount being the present cost of the Anglo-Persian Department of the Calcutta Madrasah with 500 pupils.

Now, if the Anglo-Persian Department of the Calcutta Madrasah be the School Department of the proposed college, or be amalgamated with it, then there will be hardly any difficulty in maintaining the School Department of the proposed college with the existing Government grant for the A. P. Department of the Calcutta Madrasah. In that case, we have to find out means for meeting the cost of Rs. 40,000 for the College Department only. Now, taking the monthly college fee at Rs. 5 per head, we shall have $(250 \times 5 \times 12 =)$ Rs. 15,000 per annum from fees only, and making allowance for short fees and free-studentships, as well as a smaller number of pupils at the beginning, we may fairly expect Rs. 10,000 per year from fees alone. Deducting this amount, we shall have to meet the recurring expenditure of Rs. 30,000 for the net cost of the college.

This amount can be made up by *three* different ways:—
First—From the contributions of a portion of the grant which the two provinces of Bengal receive from the Mohsin Fund supplemented by some Government grant. In this connection, my suggestion is that as the proposed college will be for the benefit of both the provinces of Bengal, each of them should contribute Rs. 12,000 from the grant of Rs. 30,000 and Rs. 22,511 allotted to them respectively from the Mohsin Fund and that the Government be approached for the balance of Rs. 6,000.

Secondly.—By strictly devoting the respective shares of the Mohsin Fund to their legitimate purposes and by retrenching its expenditure. The annual proceeds from the Mohsin Endowment Fund amounts to Rs. 1,10,747-4-0, including the annual income of Rs. 60,000 arising from the Sayedpur Trust Estate. Out of the latter sum, one-ninth share (*i. e.*, Rs. 6,666-10-8) is reserved for the salary and pension of the present and retired *Metzwallis*; three-ninth shares (or 20,000) are set apart for re-

ligious purposes; the remaining five-ninth shares (or Rs. 84,080-9-4) are for *secular* and *educational* purposes. Now, out of the sum of Rs. 84,080 (in round figures) Rs. 30,000 are allotted to Eastern Bengal; Rs. 22,511 only to West Bengal for educational purposes, and the balance, *i. e.*, Rs. 31,569 is devoted to *secular* purposes other than *educational*. In the abstract of accounts of the Mohsin Endowment Fund published in the Calcutta Gazette, we find that one-ninth of the Sayedpur Trust Estate is for secular purposes; in other words, the sum of Rs. 6,666-10-5, *only* is for purposes other than educational, and not Rs. 31,569. Now, leaving aside the one-ninth share for secular purposes as provided in the budget, a sum of (Rs. 31,569—6,666 =) Rs. 24,903 can be obtained by devoting the balance of the fund to its legitimate purposes. Further, we find that a sum of Rs. 2,573-15-3, is allotted from the Mohsin Fund to the maintenance of the Muhammadan Hostel attached to the Hooghly College. I venture to submit that this amount is a legitimate charge upon the Provincial Revenue as in the case of hostels attached to other Government Colleges, and should not be drawn from the Mohsin fund. Thus, with this amount added to the amount obtained from the sources stated above, we find that a sum of (24903 + 2573 =) Rs. 27476 may be obtained by strictly adhering to the purposes to which the Endowment Fund should be devoted. Now, with this amount supplemented by the Government grant of Rs. 2524 only the proposed college may fairly be maintained.

Thirdly—By Redistribution of the shares of the Mohsin Fund set apart for secular and educational purposes *without touching the one-ninth and three-ninth shares reserved for Mutawalli's salary and religious purposes respectively*. The proceeds of the fund available for secular and educational purposes is Rs. 84080. Deducting the one-ninth share *viz.*, Rs. 6,666 for secular purposes from the Sayedpur Trust Estate there will be a balance of Rs. 77414 for educational purposes pure and simple. As the need of a College for the Moslem students of both the Provinces of Bengal is urgent, the sum of Rs. 30000 should be set apart from the above amount and the remaining portion *i. e.*,

(77414—30,000=) Rs 47414 should be distributed for general educational purposes. At present, the amount devoted to educational purposes on all hands, is Rs. 52,511 including the grant of Rs. 30,000 to Eastern Bengal. Thus, there will be a deficit of Rs. 5097 only which may be made up by withdrawing the grant of Rs. 2573 from the Hostel attached to the Hooghly College, which as I have already pointed out, form a legitimate charge upon the Provincial Revenue or a charge upon the allotment made by Govt. for Hostels and Boarding Houses, and by adding to it Rs. 2524 from the Extraordinary Educational grant of Rs. 24½ lacs allotted to Bengal.

The three alternatives suggested above for meeting the cost of maintaining such a College show that the financial aspect of the proposal is not so embarrassing as it 'at first sight' appears to be. The outline of the scheme is now laid before the public, it is for them now to express their views on the subject and make their suggestions for working out a satisfactory solution of this difficult problem. The scheme is subject to such alterations and modifications as will be deemed necessary in the light of public opinion.

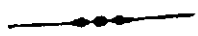
Dated, Calcutta,
the 16th November, 1911.
9, Halsibagan Road.

WAHED HOSSAIN, B. L.
Secretary, Provincial Muhammadan
Educational Conference, Bengal.

City of Birmingham
Education Committee.

ELEMENTARY
DAY SCHOOL
REGULATIONS

JANUARY, 1904.



*

BIRMINGHAM:
HUDSON AND SON, PRINTERS, EDMUND STREET AND LIVERY STREET.

1904.

CITY OF BIRMINGHAM
EDUCATION COMMITTEE,

ELEMENTARY
DAY SCHOOL
REGULATIONS.

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Marking of Registers	9, 10, 20 (d)	Weekly Return of Teachers' Absence	28 (d)

City of Birmingham
Education Committee.

ELEMENTARY DAY SCHOOL
REGULATIONS.

If, in the case of Voluntary Schools, any of these Regulations ought, by virtue of the Education Act, 1902, to be carried out by the Managers and not by the Head Teacher, such Regulations shall be read and have effect as if the directions therein contained were given to the Managers and not to the Head Teacher.

SCHOOL HOURS.

1. The school hours shall be as follow :—

- (a) Morning School, 9 a.m. to noon,
Afternoon School, 2 p.m. to 4.30 p.m.,

on Monday, Tuesday, Wednesday, Thursday and Friday in every week, except the holiday weeks.

(b) When Council schools are let for Religious Instruction by voluntary agency on Tuesday or Friday mornings, the School instruction will begin at 9.30.

HOLIDAYS.

2. The regular school holidays shall be as follow :—

Regular
Holidays.

- (a) From mid-day on the Thursday preceding Good Friday to the Monday week following.
- (b) From mid-day on the Friday preceding Whit-Sunday to the Monday week following.
- (c) From mid-day on the last Friday but one preceding August Bank Holiday to the next Monday four weeks.
- (d) From mid-day on the Friday preceding the week in which Christmas Day falls to the next Monday fortnight; but when Christmas Day falls on Friday, Saturday or Sunday, then from the previous Wednesday evening until the next Monday fortnight, and when it falls on Thursday, then from the previous Tuesday evening until the next Monday fortnight.

Provided that, in the case of any school where there are special circumstances, the Elementary Education Sub-Committee may sanction the adoption of any holidays in addition to, or in substitution for, any of the holidays above mentioned.

- (e) All Teachers must remain on duty up to the time when the schools close for the several holidays, and must be at their respective posts when the schools re-open after the holidays.

Occasional
Holidays.

3. The Head Teachers are at liberty to give not more than *four* half-days in the course of the year. Of these, two half-days may, if the Teachers think fit, be given together as one whole day's holiday. Although Head Teachers are at liberty to select their own time for these occasional holidays, all the Head Teachers in the same block of schools must agree to give the same half-days. In every case of holiday being granted, *at least four days' notice* must be sent to the Secretary of the Education Committee. These additional half-days must not be given either immediately before, or immediately after, the regular holidays. As far as possible they should be given on Friday.

ADMISSIONS.

4. When a Department is not full, no applicant for admission may be refused. Applications.

(a) When a school is full, the names and addresses of all applicants, and the date of each application, must be entered in a book provided for that purpose; and when vacancies occur the parents must be communicated with in the exact order of application, subject to the provision that preference be given (1) to children from the Infants' Department, (2) to the children of residents or ratepayers of Birmingham, and (3) to those applicants who are over five years of age. No exception to this rule will be allowed on any ground whatever, except that no child who is subject to a magistrate's order may be refused admission, even though the school be full.

5. Children eligible for admission to Infants' Departments must not be admitted to Upper Departments. Admissions to Upper Departments.

6. No child may be admitted to an Infants' Department who has passed a year in Standard I., or who will be over seven years and six months old on the last day of the Educational school year, unless there are special reasons for so doing: and the attention of the Education Committee's Inspector should be called to such cases at his visits. Admissions to Infants' Departments.

(a) Children admitted in a backward state at a comparatively advanced age must be specially prepared with a view to their promotion at the end of the school year, and all such cases should at once be notified to the Secretary of the Education Committee.

ATTENDANCE.

7. Head Teachers should not allow the average attendance for the year to exceed the number for which accommodation is provided. Accommodation.

8. Teachers are expected to enquire after absentees, but no scholar should be sent for during school hours. Absentees.

Registers.

9. All Teachers are required to take extreme care with the registers of their Classes. No scholar shall be allowed to enter the school after the registers are closed, except under special circumstances.

Removal from Registers.

10. No child's name may be removed from the register, except in the case of death, unless the School Attendance Officer reports in writing that the child is legally exempt from attendance at school, has been admitted to another school, or that his parents have removed from the City into another school district. A child must never be considered to have left the school when the absence is caused by illness.

- (a) When a child's name is removed from the register, the Teacher is expected to state upon the registers the cause of such removal, and to indicate, in the case of migration, the school to which the child has gone, or the district to which the child has removed.
- (b) If the child has left school because legally exempt, the fact should be stated and the ground of exemption given.
- (c) It shall be the duty of the School Attendance Officer to supply in writing, within reasonable time, the information necessary for the fulfilment of this regulation.

EXAMPLES.

D. Jones—Left—Gone to Christ Church, Sparkbrook; or,

D. Jones—Left—Qualified by age.

CLASSIFICATION AND PROMOTION.**Times of Promotion.**

11. Promotions shall as a rule take place at the end of the sixth month and at the end of the school year. They may, however, be made at the end of any quarter.

(a) Head Teachers of the various Departments of a school should confer, twice in the course of every school year, upon the question of transference of children eligible for promotion from the Infants' to Upper Departments, and take steps to secure that room shall be left in the Upper Department for all infants who ought to be transferred.

(b) If the number of children who should be drafted to the Upper Departments at the end of the school year will more than fill such departments, the Head Teacher must refuse admission to all other applicants until those waiting for promotion from the Infants' Department shall have been transferred. If this difficulty arise it should be at once notified to the Secretary of the Education Committee.

12. The names of all children who will be seven years of age or more at the end of the school year must be entered on Schedule A, unless such children are placed in Standard I. or promoted to Upper Departments. Schedule A.

13. The names of all children who are eligible for promotion to an Upper Department, but who, in the opinion of the Head Teacher of the Infants' Department, ought to be retained in that Department, must be entered on Schedule B, which shall be submitted to the Education Committee's Inspector for approval. Schedule B.

14. The names of all children to be transferred to the Upper Departments must be entered on Schedule C, which should be sent by the Head Teacher of the Infants' Department to the respective Head Teachers of the Upper Departments at least seven days before the date of transfer. Schedule C.

INSTRUCTION.

A.—SECULAR INSTRUCTION.

15. The Educational school year shall be from 1st August to 31st July. The course of instruction, and drawing up of the Time-table, are left to the Head Teachers, sub- Time Tables.

ject to the approval of His Majesty's Inspector and of the Education Committee's Inspector, or, in the case of Infants' Departments, the Education Committee's Inspectress of Infants' Schools, and to the fulfilment of the following conditions:—

- (a) That the Course of Instruction is in accordance with the Code;
- (b) That there is sufficient uniformity among neighbouring schools to prevent serious dislocation of study when children are moved from one school to another.
- (c) That all those subjects for the teaching of which the Education Committee provides special teachers are arranged according to syllabuses laid down for such subjects.
- (d) That the Time-table and Scheme of Instruction for the ensuing school year, both in duplicate, are sent to the Secretary of the Education Committee by the end of May in every year; one copy of each to be kept at the office for reference.
- (e) That in case of an alteration in a Time-table, notice is at once sent to the Secretary of the Education Committee.

16. All Head Teachers must have a copy of the Code and of the Instructions to His Majesty's Inspectors of Schools, and must be thoroughly conversant with the requirements specified therein.

17. The Head Teacher of any senior school may undertake the whole of the teaching of Science, without any aid from the Special Staff, at such times as may be convenient, provided:

- (a) That permission be obtained from the Elementary Education Sub-Committee one month before the commencement of the school year.
- (b) That the Head Teacher can satisfy the Sub-Committee that there is on the staff of the school a teacher properly qualified to give the instruction and perform the experiments.

18. In Council Schools one moral lesson a week, of not less than 20 minutes, shall be given to all the children in the Boys' and Girls' Schools. The series should include such subjects as obedience to parents, honesty, truthfulness, industry, temperance, courage, kindness, perseverance, frugality and thrift, government of temper, courtesy, unselfishness, and kindred moral duties. The lessons should be of a conversational character, and should be largely enforced by illustrations drawn from daily life. Moral Lessons

19. Home Lessons should be encouraged in Upper Departments, but they should not be such as to require much time in their preparation. They must never be insisted on if the parents object. Home Lessons

B.—RELIGIOUS INSTRUCTION IN COUNCIL SCHOOLS.

20. Except in the case of schools which are let for voluntary religious instruction, the school shall assemble at 9 a.m. Schools or departments of schools let for voluntary religious instruction shall open on the days when they are so let at 9.30 a.m., and *on those days* the following regulations shall not apply to them, except regulation 20 (g) (1).

(a) The children assembled for school opening shall sing a Hymn, and repeat the Lord's Prayer. The Hymns used for school opening shall be from the selection approved by the Education Committee.

(b) After the Hymn and the Lord's Prayer, the children in all departments except Infants' departments, shall be formed in classes and, according to a Time Table, shall read and learn portions of Scripture by heart, and receive from the Head and Assistant Teachers of the school, in each class, lessons on Scriptural subjects of a simple character, as well as the Moral Lessons prescribed by Regulation No. 19.

(c) The Time-tables shall be so arranged that :—

- (1) So far as possible, two-fifths of the time between 9.5 and 9.30 each week shall be given to lessons on Scriptural subjects of a simple character and subject to the conditions of the "Cowper-Temple Clause"

(Section 14, Elementary Education Act, 1870, see Appendix). No teacher of the Education Committee shall be compelled to give lessons on Scriptural subjects who has conscientious objections to so doing and makes a statement to that effect to the Head Teacher. The religious instruction referred to in this paragraph shall be clearly indicated in a written course of lessons prepared by the Head Teacher or Staff of the school; the course of lessons shall be entered in a book kept for the purpose and shall be at all times open to inspection by Members of the Education Committee.

- (2) At least two-fifths of the time shall be given each week to reading the Bible and learning it by heart, also any time which is not used for lessons in Scriptural subjects described in the preceding paragraph. The portions read and learned by heart shall be suited to the capacities of the children, and a record of the portions read and learned by heart shall be kept and shall be open at all times to inspection by Members of the Education Committee [See c (1).]
- (3) One-fifth of the time shall be given each week to the Moral Lessons provided by Regulation No. 19.
- (4) The Time-tables for the foregoing lessons shall form part of the Time-table for each department.
- (5) In schools or departments of schools let for voluntary religious instruction, the Time-table may omit the whole of c (1) or c (2) if the letting is for two days in the week; and if the school is let for one day, the Time-table may omit one of the lessons prescribed under c (1) or c (2).

(d) In all schools the secular instruction shall begin at 9.30 a.m. and the registers shall be marked in accordance with the following regulation:—In all departments except Infants' departments the registers shall be marked in red ink at 9.5 a.m. and in black ink at 9.30 a.m. In Infants' departments, when not let for voluntary religious instruction, the first marking of registers (in red ink) shall be com-

pleted after the Hymn and Lord's Prayer, not later than 9.10, and the time between such marking of the registers and 9.30 shall be occupied with Bible Reading or repetition of Texts or Hymns or the narration of Bible Stories, or Moral Lessons, care being taken to impart variety in the instruction each day. The second marking of registers shall take place at 9.30 (in black ink). When Infants' departments are let for voluntary religious instruction the registers shall be marked at 9.30 a.m. on the days when they are so let.

(e) The Superintendent of the Pupil Teachers' Central Classes shall arrange that each Pupil Teacher shall receive from herself, or from the members of her staff, not less than half-an-hour's religious instruction each week, subject to the conditions of Section 7 and 14, Elementary Education Act, 1870 (see Appendix), and each morning the Pupil Teachers' Central Classes shall be opened with a Hymn and the repetition of the Lord's Prayer, the Hymn to be from the selection adopted by the Education Committee.

(f) In accordance with the Conscience Clause (Sec. 7, Elem. Education Act, 1870, see Appendix), no child shall be compelled to receive religious instruction whose parents object to the child receiving such instruction. The same regulation shall apply to Pupil Teachers of the Education Committee. Pupil Teachers or children withdrawn from religious instruction, shall receive from 9 a.m. to 9.30 a.m., from one of the school staff, instruction in some subject of the school curriculum. In this clause the words "religious instruction" refer to the Hymn and the repetition of the Lord's Prayer and of portions of Scripture, as well as to lessons on Scriptural subjects.

(g) Regulations for Voluntary Religious Instruction: Until November, 1906, the following provisions as to Voluntary Religious Instruction in Council Schools shall apply:—

- (1) The existing facilities for the giving of religious instruction by voluntary agency, in the school buildings belonging to the Education Committee, to children attending the Council Schools, will be continued so long as the tenants comply with regulations 20 (g), 3 and 7.

- (2) In every case the wish of the parents or guardians shall determine whether a child shall receive religious instruction. To this end the following Notice shall be displayed in every school let for Religious Instruction; and a copy of the same shall be distributed through the children to the parent or guardian of every child now attending a school so let; and in future shall be supplied to each parent or guardian making application for admission of a child to any school so let.

NOTICE.

VOLUNTARY RELIGIOUS INSTRUCTION IN COUNCIL SCHOOLS.

Religious Instruction is given on _____ morning in each week from 9 to 9.30, by _____ of _____ [Name, place of worship, or society] Parents who *do not* wish their children to attend this instruction are at liberty to withdraw them. Any Member of the Education Committee, Parent, or Guardian may attend these services.

- (3) Any persons proposing to give religious instruction shall be required to pay to the Education Committee a rent for the use of the buildings. The rent is five shillings per annum for each department (boys', girls', or infants') for each morning in the week. In all central hall schools, the mixed department will be charged as two departments.
- (4) Opportunity for religious instruction shall be given on Tuesday and Friday morning in every week.
- (5) The schools shall open, under the management of the Education Committee, not more than half an hour later when let for religious teaching than on other days.
- (6) Any future application for the use of the School buildings for the giving of religious

instruction, in accordance with these regulations, shall be referred to the Sites and Buildings Sub-Committee for them to report to the Education Committee.

- (7) Voluntary Teachers shall note in a book kept for the purpose their attendances and times of arrival. Irregular or unpunctual Teachers will be cautioned by the Secretary of the Committee, and if unpunctual or irregular after two cautions will lose their tenancy. Copies of the voluntary teachers' attendance entries taken from the book kept at the school, shall be furnished by them to the Secretary of the Education Committee, when each payment of rent is made. These rents shall in future be paid quarterly.

TEACHING STAFF.

21. In Council Schools engagements of Head Teachers Engagements. are subject to three months' notice on either side, and engagements of Assistant Teachers to one month's notice. Every notice must terminate on the last day of a month.

(a) Teachers are expected to give their whole time to the service of the Committee during school hours, and also so much time out of school hours as may be necessary for the effective conduct of the school work.

(b) No Teacher may form a special class at the school of day school scholars for extra instruction, as a means of earning additional remuneration.

(c) The strength of the staff must never be less than is required by the Government Code; but the exact staff of each school must of necessity be determined by the nature of the premises and the special circumstances. There should always be a responsible teacher in charge of each room, and pupil teachers should never have sole charge of classes except in the last two years of their apprenticeship.

22. Every Head Teacher is expected to take an active Head Teachers. part in teaching, in addition to the superintendence of the school and the staff. He should from time to time hear his Assistants give lessons, and when he considers it would be helpful, offer friendly criticism.

(a) A Head Teacher is expected to report to the Education Committee any insufficiency or unsuitability in his or her staff.

(b) When changes in the staff of any kind are required, the Head Teacher is requested to fill up the proper form and forward it at once to the Office.

(c) Head Teachers are expected to see that the buildings and furniture are kept in good repair, and to acquaint themselves with the rules laid down for the Caretakers, and to report to the Secretary of the Education Committee any matter that requires attention.

Assistants,
Duties of.

23. The Chief Assistant Master or Mistress shall take the place of the Head Master or Mistress during his or her temporary absence from illness or any other cause.

(a) All Teachers are expected to assist the Head Master or Mistress in making up necessary returns, etc.

(b) Class Teachers shall not be withdrawn from the work of teaching for the purpose of posting or summarising registers, or for any other clerical work, except for urgent reasons.

(c) At least two Teachers must be present in each playground with the children during intervals allowed for play, and at least one Teacher must be in charge of the school department during the mid-day recess.

(d) No child shall be locked in the school at any time after school hours.

Qualifications to
be acquired by
Assistant
Teachers.

24. Assistant Teachers are expected to pass the Government Certificate Examination within four years from the date of their appointment. All Assistant Teachers must obtain either the "Intermediate Certificate" or the "School Teacher's Music Certificate," in the tonic sol-fa method of teaching Singing, and also Certificates in Drawing (Assistant Masters the Elementary Teacher's Certificate). All engaged in Boys' and Girls' Schools must obtain a Certificate in Physical Exercises. Assistant Mistresses must obtain Certificates in Needlework, and those engaged in Infants' Schools, in Kindergarten. In considering applications for promotion, and for increases of salaries, the

Elementary Education Sub-Committee will enquire whether these Certificates have been obtained, and what other studies (if any) have been pursued by the Teacher.

25. Head Teachers must not on any account prevent the punctual attendance of their Pupil Teachers at the Central Classes. Pupil Teacher Attendance at Central Classes.

(a) In consequence of the attendance of Pupil Teachers being required at the Central Classes, they must not be employed in any work extending beyond the ordinary hours on the days on which they attend those classes.

26. Candidate Pupil Teachers and Pupil Teachers shall, as a rule, give criticism lessons monthly, in the presence of their Head Teacher or the Chief Assistant. The lessons should cover the whole of the subjects taught in the Classes. Each Pupil Teacher is provided with a journal, in which entries must be made by the Head Teacher as required. A record of each lesson should also be entered in the book provided for this purpose. Criticism Lessons.

27. Every Teacher is required to be at school at least ten minutes before the time appointed for opening. Teacher Attendance.

(a) A Time Book is provided in which every Teacher is required, both morning and afternoon, to enter his or her name immediately upon arrival, so that the entries show the order of arrival and the times. The same book must be signed on leaving.

28. No Teacher may be absent from duty except under the following circumstances:— Teacher's Absence.

(a) In case of illness occurring to an Assistant Teacher or Pupil Teacher, information should be sent at once to the Head Teacher; and, in case of a Head Teacher, to the Secretary of the Education Committee. If any Assistant Teacher or Pupil Teacher be absent, the Head Teacher must be satisfied that the absence is reasonable. Whenever a Teacher is absent from duty for more than three days, a medical certificate from a duly registered medical man will be required. In the case of an extended absence, a medical certificate will be required every fortnight until duty is resumed. All medical certificates shall be sent to the Head Teacher, who will forward them to the Office.

(b) If leave of absence for a period not exceeding three days be required, it must be obtained by Head Teachers from the Secretary of the Education Committee, or the Managers as the case may be, and by Assistant Teachers from their own Head Teachers. Such leave of absence must not be given either immediately before or after the regular school holidays.

(c) Leave of absence for longer periods can only be granted by the Elementary Education Sub-Committee, or (in the case of Voluntary Schools) by the Managers, subject to the approval of the same Sub-Committee.

(d) A weekly return showing all cases of absence of Teachers from duty, and all vacancies on the staff, must be sent by the Head Teacher of the department to the Secretary of the Education Committee, on a form to be supplied for that purpose. A register is kept at the Office in which all such reported absences are duly recorded.

CORRESPONDENCE.

29. All official communications should be addressed to the Secretary of the Education Committee.

(a) On Fridays the Caretakers of Council Schools will bring to the office any books, letters or papers, that the Teachers may have to send.

(b) Teachers must immediately report to the Secretary of the Education Committee any change of their private address.

REQUISITIONS.

30. Requisition Forms are supplied, on which application for School Materials should be made. These forms should be sent every alternate month. Requisitions respecting furniture should be made to the Inspectors at their visits to the schools.

31. Head Teachers will be held responsible for the goods received being equal in quality with the samples. No goods must be used until they have been carefully compared with the invoice, and, when necessary, with the samples, which may be inspected at the Office.

32. All articles supplied to the schools shall be entered in a Stock and Stores Book, and not be written off, so long as the articles remain in the school premises. Stock and
Stores Book.

(a) No article shall be removed from the school premises, without the written authority of one of the Committee's Inspectors (in Infants' Schools, the Committee's Inspector), or the Inspector of Stock and Stores. Drawing Books, Exercise Books, and Examination Papers may, however, be given to the scholars who have used them, and be taken home, if the Head Teacher thinks fit, but not until the books are *completely* filled. This regulation is not intended to prevent the use of Reading Books and paper by the scholars for home lessons.

(b) When any articles have been authorised to be removed, the Inspector of Stock and Stores will, upon receiving an application in writing from the Head Teacher, make arrangements for the removal of such articles.

33. When goods are received without an invoice, information should be at once sent to the Secretary of the Education Committee. When an invoice has been checked, it should be initialled by the Head Teacher and forwarded to the Secretary of the Education Committee without delay. Invoices.

INFECTIOUS DISEASES.

34. Teachers are required to be extremely careful in noting all cases of Infectious Disease occurring amongst the children attending their respective schools; and must on no account permit any child suffering from such disorder, or residing in the same house as any other person suffering from such disorder, to attend the school. Whenever an Attendance Officer discovers a case of Fever, or other Infectious Disease, he is required immediately to report it to the Chief Superintendent of Attendance Officers, and also to the Head Teacher of the school which any child resident in the house where such Infectious Disease exists, may attend. Children
suffering from
Infectious
Diseases.

35. The Head Teacher is required to inform the Head Teachers of the other departments of the same school of any case of Infectious Disease which may come to his or her Information.

knowledge, and which may in any way endanger the children attending either of the other departments. The Head Teacher is also required to report all such cases to the Attendance Officer of the district. Teachers must also report to the Secretary of the Education Committee any case of Infectious Disease in their home.

Return to
School.

36. No child is to be re-admitted after suffering from an Infectious disorder, or after any other person resident in the same house has suffered from an Infectious disorder, without either a certificate from a duly qualified medical man, stating that such a child may be safely re-admitted, or a letter to the same effect from the Chief Superintendent of Attendance Officers. Such a letter should only be given by the Chief Superintendent as the result of careful inquiry into the case.

Diphtheria.

37. No child who has suffered from Diphtheria may return to school without a certificate to the effect that a bacteriological examination has been made, and the secretion from the throat has been pronounced harmless and incapable of carrying infection. A bacteriological examination will be made, free of charge, at the Birmingham University. Such examinations are made at the request of the attending doctor, who should forward to the University specimens of this secretion.

Disinfectants.

38. Disinfecting powder or fluid, or both, will be supplied to a school situated in a neighbourhood in which any Infectious Disease is prevalent. The Head Teacher is expected to see that the disinfectants are used by the Caretaker carefully and according to the instructions which are supplied with the goods.

PUNISHMENT.

39. Head Teachers are responsible for all forms of punishment used in the schools, and for complying with the requirements of paragraph 37 in Appendix II. of the Revised Instructions applicable to the Code of 1902.

40. Head Teachers are instructed to exercise care when children are "kept in" after school hours, that the detention may be strictly limited in time and not provoke any reasonable complaints from the parents, or be in any way injurious to the health of the children. Detention.

41. Head Teachers may suspend, but must not expel children from attendance at school. When a suspension takes place the Head Teacher should at once report it to the Secretary of the Education Committee, who shall bring the matter before the Elementary Education Sub-Committee. Suspension.

BUILDINGS, PREMISES, PLAYGROUNDS.

42. No rooms, lavatories, corridors, etc., other than the ordinary school-room and class-rooms, may be used for teaching purposes, without the previous approval of the Education Committee.

(a) The Council school premises shall not be used for Entertainments, Exhibitions, or other purposes, without the previous sanction of the Education Committee.

(b) Children (especially infants) should never be sent into the playgrounds in cold weather without such extra clothing as they may have brought with them.

(c) No person, except the Head Teacher and the Caretaker, shall hold any entrance key of the Council School buildings or premises. The Head Teacher and Caretaker, on ceasing to hold their respective offices, shall hand over all such keys then in their possession, to the Secretary of the Education Committee.

MISCELLANEOUS.

43. Form 9 of the Board of Education shall be filled up by the third day of each financial school year. Government Form.

44. No hand-bills shall be distributed or announcements made to the scholars, except on school business, without the previous sanction of the Education Committee. Announcements.

45. Head Teachers shall report immediately and fully to the Secretary of the Education Committee, and to the Managers as the case may be, any accidents that occur in the school premises. Accidents.

46. Teachers must not circulate any literature, nor make any arrangements or announcements referring to political or municipal elections in their schools, nor use the school premises for the purposes of such elections, except on the same terms and under the same conditions as other hirers.

Geo. Arthur Palmer

Secretary of the Education Committee.

29th January, 1904.

APPENDICES.

- I. RELIGIOUS INSTRUCTION.
- II. REGULATIONS AS TO INFECTIOUS DISEASES.
- III. SCALES OF SALARIES OF HEAD TEACHERS, ASSISTANT
TEACHERS, AND PUPIL TEACHERS.
- IV. REGULATIONS AS TO SCHOOL PIANOS.
- V. PRIZE SCHEME FOR DAY SCHOOLS.

APPENDIX.

SEC. 7, ELEMENTARY EDUCATION ACT, 1870 (CONSCIENCE CLAUSE).

Every Elementary School which is conducted in accordance with the following regulations shall be a public elementary school within the meaning of this Act; and every public elementary school shall be conducted in accordance with the following regulations (a copy of which regulations shall be conspicuously put up in every such school), namely:—

- (a) It shall not be required, as a condition of any child being admitted into or continuing in the school, that he shall attend or abstain from attending any Sunday School or any place of religious worship, or that he shall attend any religious observance or any instruction in religious subjects in the school or elsewhere, from which observance or instruction he may be withdrawn by his parent, or that he shall, if withdrawn by his parent, attend the school on any day exclusively set apart for religious observance by the religious body to which his parent belongs;
- (b) The time or times during which any religious observance is practised or instruction in religious subjects is given at any meeting of the school shall be either at the beginning or at the end, or at the beginning and the end, of such meeting, and shall be inserted in a Time-table to be approved by the Education Department and to be kept permanently and conspicuously affixed in every school-room; and any scholar may be withdrawn by his parents from such observance or instruction without forfeiting any of the other benefits of the school;

- (c) The school shall be opened at all times to the inspection of any of His Majesty's Inspectors so, however, that it shall be no part of the duties of such Inspector to inquire into any instruction in religious subjects given at such school, or to examine any scholar therein in religious knowledge or in any religious subject or book;
- (d) The school shall be conducted in accordance with the conditions required to be fulfilled by an elementary school in order to obtain an Annual Parliamentary Grant.

SEC. 14, ELEMENTARY EDUCATION ACT, 1870 (COWPER-TEMPLE CLAUSE).

Every school provided by a School Board shall be conducted under the control and management of such Board in accordance with the following regulations:—

- (a) The school shall be a public elementary school within the meaning of this Act;
- (b) No religious catechism or religious formulary which is distinctive of any particular denomination shall be taught in the school.
-

DISEASES.	INCUBATION PERIOD.	DURATION OF DISEASES.	WHEN INFECTION BEGINS.
MEASLES	5—19 days ; generally 10.	1 week.	Earliest stage, before the symptoms appear.
GERMAN MEASLES (Rubella)	9—21 days ; generally 18.	1 week.	About 3 days before patient appears ill.
SCARLET FEVER	2—4 days ; generally 2.	1 week.	At onset.
CHICKEN POX . .	11—19 days ; generally 14.	3—7 days.	At onset.
SMALL POX . . .	5—20 days ; generally 12.	About 17 days.	At onset.
MUMPS	14—25 days.	10—14 days.	Before signs of swelling.
WHOOPING COUGH	5—14 days.	2—8 weeks.	Before the "whoop" appears.
DIPHTHERIA. . .	2—7 days ; generally 2.	Variable ; about 10 days.	At onset.
TYPHOID FEVER	8—23 days ; generally 14.	3 weeks.	At onset.
INFLUENZA . . .	1—5 days ; generally 3.	Variable ; 4 days — 2 weeks.	At onset.

* *Memo.*—Period of quarantine applies to other members of the family, being children who have had Whooping Cough are required to attend school, and case of the disease exists in their family or in the house in which they are.

No child who has suffered from Diphtheria may return to school without a secretion from the throat has been pronounced harmless and incapable of secretion.

In cases of children suffering with verminous heads, the teachers are instructed

DISEASES.

* QUARANTINE NECESSARY.	MODE OF INFECTION.	LEADING SYMPTOMS.
3 weeks after commencement of attack.	Personal Intercourse.	Cold in Head. Cough. Fever. Rash.
10 days after symptoms begin.	Personal Intercourse.	Rash. Enlarged and Tender Glands. Slight Fever.
At least 6 weeks after commencement of rash, if patient appears well.	Personal Intercourse. Clothes and Books. Milk.	Sore Throat. Shivering or Vomiting. Rash. Fever.
From appearance of rash till scales have gone ; 2-3 weeks.	Personal Intercourse. Clothes, &c.	Rash. Slight Fever.
1-2 months after commencement.	Personal Intercourse. Infected Articles. By the Air.	Marked Bodily Pains. Rash. Fever.
3 weeks after onset at least.	Personal Intercourse.	Swelling on both sides of neck. Pain on opening the mouth. Fever.
6 weeks from commencement.	Personal Intercourse. Sputum.	Paroxysmal Cough.
6 weeks-6 months.	Personal Intercourse. Clothes. Milk.	Sore Throat, with Membrane. Fever.
	Stools, Urine. Personal Contact. Milk.	Headache. Lassitude. Fever. Diarrhoea or Constipation.
About 10 days after onset.	Personal Intercourse.	

school children, in all diseases except Whooping Cough and Typhoid Fever, those who have not had Whooping Cough are to be kept away from school if a living.

certificate to the effect that a bacteriological examination has been made, and carrying infection. A bacteriological examination will be made free of charge, the attending doctor, who should forward to the University specimens of this

to at once communicate with the Office, stating names and addresses.

SCALES OF SALARIES OF TEACHERS.

HEAD TEACHERS.

	PER ANNUM.	
	AVERAGE	MAXIMUM
	ATTENDANCE, SALARY.	
Masters of—	£	
Mixed Departments of Class-room Schools...	...	300
Boys' or Mixed Schools, of about	375...	275
" " "	300...	250
" " "	250...	220
" " "	200...	200
" " "	150...	190
" " "	100...	180
Mistresses of—		
Girls' or Mixed Schools, of about	350...	190
" " "	300...	180
" " "	250...	160
" " "	200...	140
" " "	150...	135
Infants' Schools of about	550...	190
" " "	400...	180
" " "	300...	160
" " "	200...	140
" " "	150...	130
" " "	100...	120

ASSISTANT TEACHERS.

Unless otherwise determined by special resolution, the following will be the scale of salaries for technically qualified Assistant Teachers:—

GRADE.	MINIMUM. MAXIMUM	
	PER ANNUM.	
	£	£
Chief Assistant Masters in Class-room Schools	100	175
Chief Assistant Masters in Boys' Schools	100	150
Certificated Assistant Masters, 1st or 2nd Division, 2nd Year's Papers:		
<i>College Trained</i>	80	140
<i>Non-College Trained</i>	75	140
Uncertificated Assistant Masters and those below the grade of 2nd year's papers, 2nd Division	55	75
Chief Assistant Mistresses in Girls' Departments of Class-room Schools	80	130
Chief Assistant Mistresses in Girls' Schools	80	110
Chief Assistant Mistresses in Infants' Schools	80	110
Certificated Assistant Mistresses, 1st or 2nd Division, 2nd Year's Papers:		
<i>College Trained</i>	70	100
<i>Non-College Trained</i>	60	90
3rd Division on 2nd year's papers (obtained since 1st Jan., 1891)	60	70
Uncertificated Assistant Mistresses and those below the grade of 2nd year's papers, 3rd Division	45	60

**ASSISTANT TEACHERS IN HIGHER GRADE
SCHOOLS AND
ASSISTANT SCIENCE DEMONSTRATORS.**

	MINIMUM.	MAXIMUM.
	£	£
First Assistant Masters	130	180
Ordinary "	100	145
Ordinary Assistant Mistresses	80	120

MANUAL INSTRUCTORS.

Manual Instructors	80	130
Assistant Instructors	75	100

COOKERY TEACHERS.

Teachers of Cookery	70	90
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Notes :

1. All Salaries of Assistant Masters and Mistresses will remain fixed at the amount first agreed upon, until raised by resolution of the Education Committee.

2. A few additional Assistants may be appointed from time to time, on special recommendation, who, though not *technically* qualified, give evidence of good education, and desire to obtain certificates. In these cases, the rate of salary will be fixed by special resolution.

3. All increases of salaries are considered once a year only, viz., upon receipt of the Report of His Majesty's Inspector for each School.

4. Increases of salaries to the minimum rates for Certified Teachers will date from the 1st day of the month next succeeding that in which the Certificate Examination is held.

5. All increases of salaries of Head and Assistant Teachers will date from the 1st day of the financial school year.

6. Head and Assistant Teachers receiving their first appointments to schools at times other than the commencement of a new financial school year will be allowed proportionate increases for the period of service which has elapsed since the date of their appointment, provided that their service has been satisfactory, and that there has been no break in its continuity.

7. Teachers who have been promoted or transferred will be allowed proportionate increases for the period of service which has elapsed since the termination of the financial school years of their former schools, provided that their service has been satisfactory, and that there has been no break in its continuity.

8. The principle of proportionate increases set out above will also apply to cases where the dates of the financial school years have been altered.

9. The increases of salaries of Certificated Assistant Mistresses holding Certificates of the 3rd Division and of Assistant Mistresses below that grade, after reaching the old maximum of £65 and £55 respectively, to be £2 10s. per annum, instead of £5.

SCALE OF SALARIES FOR TEACHERS OF MENTALLY DEFECTIVE CHILDREN.

	MINIMUM. MAXIMUM.	
	£	£
Certificated Assistant Mistresses, 1st, 2nd or 3rd Division on 2nd Year's Papers:		
<i>College Trained</i>	80	110 per ann.
<i>Non-College Trained</i>	70	100 ,,
Uncertificated Assistant Mistresses	70	80 ,,

The maximum salary of teachers in charge of a Special School consisting of more than one class, and having the direction of an Assistant, to be £10 per annum higher than stated above.

PUPIL TEACHERS.

Pupil Teachers and Candidates are paid at the following rates:—

Boys.

Candidate Pupil Teachers taking work below that for the first year, according to the Code of the Board of Education.	} £10 per annum for 6 months	
		} £15 „ afterwards, until the indenture is actually signed.

PER ANNUM.

Passed Government Examination for Apprenticeship	1st year	£20	0	0
Ditto ditto ditto	2nd year	22	10	0
Ditto ditto ditto	3rd year	25	0	0

GIRLS.

Candidate Pupil Teachers taking work below that for the first year, according to the Code of the Board of Education.	} £8 per annum for 6 months	
		} £10 „ afterwards, until the indenture is actually signed.

Passed Government Examination for Apprenticeship	1st year	£15	0	0
Ditto ditto ditto	2nd year	17	10	0
Ditto ditto ditto	3rd year	20	0	0

(The Scale for Pupil Teachers dates from the date specified in the indenture, *i.e.*, 1st January or 1st July of each year.)

SCHOOL PIANOS.

The Pianos purchased by the Education Committee are placed in the charge of the Head Teachers of the Departments to which they are supplied.

The Pianos are to be kept locked when not in use.

The Pianos are not to be let, nor are they to be used for any other than Day or Evening School purposes, except by special permission of the Education Committee.

When School Pianos are allowed to be used on Sundays, in connection with Sunday Schools or Religious Services held on continuous tenancies, the charge will be at the rate of £2 per annum; for casual lettings, including Soirées, Concerts, or other School entertainments, the charge for the Pianos will be 5s. for each letting.

The Pianos purchased by the Education Committee will be periodically tuned by a firm appointed by the Education Committee and by no one else.

Covers will be provided by the Education Committee to keep the Pianos free from dust.

PRIZE SCHEME FOR DAY SCHOOLS.

No prize will be awarded unless general conduct is satisfactory.

SENIOR SCHOOLS.

Exceptions not exceeding two in each year may be allowed for Sunday School or other treats, but only if permission has been previously obtained from the Head Teacher. Leave of absence may also be allowed for the purpose of enabling Scholars to attend the Admission Examinations to the King Edward's Schools, the Municipal Technical School, the Council Higher Grade Schools, and also the several Examinations for Scholarships. Attendances lost by Jewish children on Jewish holidays, and attendances lost by children absent on account of infectious diseases in their homes may be allowed.

1. An attendance prize annually for those who have not been absent or late during forty complete weeks of the Educational School year (exceptions as above).

2. One Prize in every class twice a year for attention to work, as shown by the continuous record and proficiency and industry, as shown by marks obtained during the term where such are used.

3. One Prize in every class twice a year, the subject to be decided upon by the Head Teacher, as the one requiring the most attention in the School.

4. A Bronze Medal will be given to the scholars who have gained an Attendance Prize during each of four consecutive years, and a Silver Medal to those who have gained an Attendance Prize during each of eight consecutive years, which may include, in either case, the last two years spent in an Infants' Department. The name of the scholar and the year will be engraved on the medal (exceptions as above).

VALUE OF PRIZES (Published Prices).

Standards I., II., and III.....	2/-	} Perfect Attendance Prize.
Standards IV. and V.....	2/6	
Standards VI. and VII.....	3/6	

CLASS PRIZES.

Standards I. and II.	1/-
Standard III.	1/6
Standards IV. and V.	2/-
Standards VI. and VII.	3/6

INFANTS' SCHOOLS.

1. An annual attendance prize of the value of 2/- to children in Standard I. who have not been absent or late during forty complete weeks of the Educational School year. (Exceptions as above.)

2. An annual attendance prize of the value of 1/- to children in classes between the Baby-room and Standard I. who have not been absent or late during forty complete weeks of the Educational School year (Exceptions as above).

3. Prizes of the value of £1 for every 100 children in average attendance will be given in each School during the year, the Prizes to be left to the discretion of the Head Teacher, subject to the restriction that no Prize under this clause shall exceed in value the perfect attendance prize as arranged by clauses 1 and 2.

THE
MISSIONARY CRUSADE
AGAINST
STATE EDUCATION
IN
INDIA.

"Thus, duties rising out of good possess'd,
And prudent caution needful to avert
Impending evil, equally require
That the whole people should be taught and train'd."

WORDSWORTH.

BY
A NATIVE OF SOUTHERN INDIA.

MADRAS.

1888.

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Madras.

1883.

Printed at the Empress of India Press, Popahin's Broadway, Madras.

THE
MISSIONARY CRUSADE

It cannot be denied that the present is a most critical moment for the cause of Education in India; and there are reasons for thinking that the unfortunate differences which exist, urged on in the way and to the extent which they have been, are likely to terminate in results far from satisfactory, and even such as to upset all the educational Work of nearly half a century. The grave evils that would certainly spring from the success of the Missionary agitation against the maintenance of the State connection with Higher Education are so great that it is necessary to counteract them; and it is most important that the Education Commission and the Viceregal Council, as well as the public both here and in England, should have laid before them all relevant facts and the convictions and feelings of the people of the country as to the manner in which, and agency whereby their children shall be educated, and thus should have the means of forming a correct judgment, before they are misled to join in the persistent missionary crusade against the enlightened policy to which the marked improvement of late years in the education of all classes in India is mainly attributable. It is from no desire "to prejudice and oppose the action of the Viceregal Commission," as certain missionary agents are ready to insinuate when any one ventures to raise his voice on this subject, that we publish the following remarks—our aim is simply to enquire into the

real meaning and motive of the agitation set on foot by a powerful missionary faction against the existing educational plans of the Government, and solemnly appeal to every responsible Statesman in India and England and every unprejudiced Member of the Education Commission, entreating each one to pause ere he allows himself to be carried away by the repeated utterances of these missionaries, and thus imperils by his vote the very foundations of our well tried educational structure and the best means of promoting the general progress and enlightenment of the country.

I. It is claimed by the Missionaries, and we have no wish to contest the claim, that the appointment of the Education Commission was brought about by the Missionary agitation, especially in Madras. The inference as to what must be expected from it by its promoters is only too obvious.

(a) In the *Free Church Monthly* of the 1st June 1882, (p. 177) the following passage occurs :—

“Early in April the Rev. W. Miller returned from Calcutta to Madras, after having done noble service in the cause of Christian and independent education as a Member of the Government of India’s Commission, which has closed its first session of inquiry. He writes most hopefully of the effect of this inquiry, *which, more than any other, he has brought about, * * * **.” “I (Mr. Miller) did not press our Madras grievances. They are known in a general way, to the members of the Commission, and it is tolerably well-known how large a share they had in the formation of the Commission.”

(b) The following passage occurs in the *Madras Mail* of the 11th March 1882 :—

“We were recently informed by telegraph from Calcutta that ‘the Council of Education in England and several important Missionary bodies formally accuse the Indian Department of Public Instruction of having diverted an undue share of public money from the general education of the people at large to the over-education of a small and favored class.’ This confirms our previous suspicions as to the origin of the Educational Commission. The action of the Government

has been instigated by certain religious bodies in England, moved thereto by their agents in this country. The Missionary bodies have some resemblance to the Manchester manufacturers. They have the same perseverance: they bring the same sort of pressure to bear on Viceroy and Secretaries of State; and they have been crowned at last with the same success. There is also the same want of frankness in the main plea they put forward. Both place the hardship to the poor in the front of their complaint. Without stopping to inquire how far this is sincere on the part of the manufacturers, we may say that this zeal for the education of the masses comes strangely from the lips of men whose efforts have chiefly been given to the higher education, and who are now turning out from their schools nearly as many over educated men as the government institutions. It is not quite ingenuous of the missionary societies to attack the higher education at the very time when they are striving to extend their own operations, and to get the whole of this kind of work into their own hands; nor can we say that the Supreme Government have been perfectly frank in making no mention of the power behind them at whose instigation they are acting. The Government speak in their resolution of handing over their schools and colleges to groups of native gentlemen. But these are only stalking horses. Behind them are the missionary bodies, waiting till the moment comes to declare themselves. Our chief concern, however, is not with nice points of conduct, but with a broad policy. Government, it is supposed, are now about to surrender into private hands one important part of their own duty, and we have now to see if those who undertake the work have the means to carry it out, and have such a prospect of permanency that Government can safely leave it in their hands."

II. The self-styled and self-constituted "General Council on Education in India," while disclaiming in express terms to be "identified with any party," is nothing but a clique of restless agitators for the overthrow of national, and the spread of missionary, education; for we hesitate to apply the name Christian to a system of education which is a libel on Christianity, and whose advancement is being at the present moment promoted by an agitation of "a hollow, selfish and unprincipled character." (Dr. Duncan's evidence before the Commission at Madras, page 25.)

The "General Council" published in the early part of 1882, "for private circulation," a pamphlet, which we shall hereafter, for the sake of brevity, refer to as the *Secret Pamphlet*, entitled "Answers to Queries on the working of the Educational Despatch of 1854, sent out by the General Council on Education in India." It consists of (1) An introductory note signed by a person now notorious in India in connexion with educational agitations, the Rev. James Johnston, (2) A list of Queries, (3) Answers to Queries, (4) An Appendix, Pages 1—29 are occupied with the answers of missionaries and missionary-schoolmasters, all, of course, hostile to Government Institutions. Pages 30—38 deal with answers to queries which are thus spoken of in an introductory note :—

"The four papers which follow are of special interest, and with one exception of great value as coming from a class of men from whom we should not presume to solicit answers to our unofficial inquiries, and whose personal interests and prepossessions would naturally be on the side of the order of things by which they have risen and through which they must rise higher. We give them with much satisfaction as samples of not a few in their position, only wishing that more had reached us, while grateful that even these have spoken so freely out. Nothing but deep conviction and a generous impulse could have led three of these gentlemen to rise so far above official reserve and the influences of their order, and speak out as they have done. As for the other, who has favoured us with the routine view with which official reports are filled, we let him speak for himself as an average example of his class."

The reader will at once perceive the humour of such an utterance by an association which "neither originated with, nor represents the missionary societies labouring in India" (*Secret Pamphlet*, p. ii) and which "is not identified with any party" (*Id.* p.iii). The unfortunate gentleman "who has favoured us with the routine view with which official reports are filled" is "a Professor in a Government College" (*Secret Pamphlet*, p.35), who, having honestly stated

his views on the different points upon which the "Council" thirsted for knowledge, which are the views of more than nine-tenths of those who have the good of India and its millions at heart, is thus denounced, simply because he did not fall in with the missionary proclivities of this so-called "Council," which "is not identified with any party," and which does not "represent the missionary societies labouring in India." The Appendix opens with the following words:—"Besides the formal answers to the queries sent, we have received many communications, both public and private, of great importance, bearing on this question, from which we subjoin a few extracts." (N.B.—Purely missionary evidence is given *in extenso*). We have then a sort of paraphrase or abstract of a statement "of much value" by the Director of Public Instruction, Bengal; but what the real value of the abstract is, it is utterly impossible to say, as H. H. the Maharajah of Travancore has but recently very clearly shown*, and the Governor of Madras, in his letter to His Highness, published in the same pamphlet, is of the same opinion, that Mr. Johnston's manipulation of statements not quite favourable to his own views is apt to be influenced by these views, and that, therefore, his representations of other people's views are perfectly worthless as showing what others think, and absolutely inadmissible as proof of any fact of this kind, be it what it may. Allusion is then made to "several public documents" sent by Dr. Leitner of Lahore. We have next an extract from a letter addressed by Mr. Grigg, Director of Public Instruction, Madras, to the Local Government, recommending an increased grant to the Christian College, which having been refused, of course, constitutes a grievance in the eyes

* In a pamphlet entitled "A Cursory Notice of certain statements in the Rev. James Johnston's Reply," to his Highness's letter to the Governor of Madras.

of the "Council" (not identified with any party) and its irrepressible Honorary Secretary. Then we have the following statement :—

"Partiality in the Education Department comes out in other matters than grants-in-aid. Take, as an illustration, the composition of the University of Madras, on which much of the character of education depends.

(1) The Wesleyan Mission, the London Mission, the German and American Missions are quite unrepresented in the University, though all do something, and the two first an immense deal in education. (2.) Of the 93 members of the Senate, all but 25 are Government servants and even some of these 25 are more or less bound to Government. (Of course many of the Government servants are capital men). (3.) Of the 93, 22 are directly and distinctly in the Government Education Department, and only 13 are in any way at all (many of them very indirectly) representatives of aided education. (4.) In the Presidency College there are eight professors and assistant professors; in the Christian College there are seven. I don't think there is a man in Madras who would say that the *eight* are superior to the *seven* in academic rank or in any way more distinguished: yet out of the *eight* no less than *seven* are members of the Senate, out of the *seven* only *two*. This, we think, would not be tolerated in Calcutta or Bombay."^{*}

It will be observed that in this extract, this Council which is not identified with anybody, and which represents itself as the champion of *all* education independent of Government, is here, as everywhere throughout the Secret Pamphlet, concerned only about the supposed grievances of certain missionary bodies, anxious that they and they alone should have the supreme control of education in India.

Here, then, is a pamphlet of 41 pages and four pages of an introduction, professedly put forth to further the principles laid down in the Despatch of 1854. Nineteen-twentieths of the pamphlet is devoted to tirades against Government schools by missionaries, and one witness, who ventures to defend them, is de-

^{*} This misleading statement is fully answered by Dr. W. H. Wilson in his Evidence and Cross-Examination before the Education Commission.

nounced in a most ungentlemanly and uncalled for manner. No one, at least so the pamphlet hints, can speak the truth on the subject of Indian education except missionaries. In these circumstances, we confidently ask the unbiased reader to judge of the sincerity and ingenuousness of the following statement :—

“The Council on Education is not identified with any party. We are, from conviction based on experience, in favour of carrying out the principles of the Despatch of 1854, as being the best for the present condition of Society in India. We take our stand on that Despatch, as from the first the declared policy of the Government, though it has never had a fair and full trial, but which has whenever tried, proved by results its adaptation to the wants of the country. (Secret Pamphlet, p. iii).

From the facts we have stated it is abundantly clear, that this so-called “Council” is a body working in behalf of missionary education in India.

The Rev. J. Johnston, in his letter to the Maharajah of Travancore, in which he professes to explain the aims of the “Council,” says :—“We have been misrepresented as seeking the transference of Government Colleges to missionary societies.” Let the Rev. J. Johnston speak for himself. In his pamphlet, “Our Educational Policy in India,” second edition, 1880, the following passages occur, (pp. 42—43) :—

“We have had noble examples of liberality among the natives of India in both building and endowing colleges and schools before Government began to do it for them.

“We do not expect them to volunteer to do this; like most subjects of an absolute Government, they prefer to have everything done for them. But if left alone in a firm, cautious, and friendly spirit, they could and would provide it for themselves.

“But would this be an advantage in a missionary point of view? That is not with me the first question. Is it right in itself? That is what we have to see to; and if it is right, I am sure it will be best for the righteous cause.

“Missions have nothing to fear in a fair competition with natives of any class. It is only the unfair competition with a Government, backed by the prestige and pay that makes voluntary efforts by either natives or missions so arduous or impossi-

ble. If that competition were withdrawn, we have reason to believe that colleges would soon cease to be a burden on the funds of the Church. They would, with slightly higher fees and a larger attendance, pay their own expenses. The average attendance at aided colleges is only seventy-four; they could educate three or four times that number without any corresponding addition to their contributions *from home*.* If any should still say that the Natives of India could not or would not support colleges for themselves, I would only say, that in that improbable and sad case they would have themselves to blame, and could not charge on Government the fault of aiding either missionary societies or European residents in providing the needed means of education."

Again at pp. 54—55 the pamphlet is concluded thus :—

"There will be opposition, there may be a conflict, imperiling our rule, if not our existence, in the country, ere that triumph is attained, but it will come, and it will, we believe, come with a sudden and mighty rush which will startle and amaze an incredulous age. Hinduism is like no other system that now exists, or has ever existed in the world. It seems as if it would defy those processes of disintegration, by which believers may be gathered by units or tens or hundreds from other sects and races, in other systems, in other lands, or even in India, as among the aboriginal tribes, or those simpler races in Tinnevely and Travancore, which never fully partook of the fatal privileges of Brahminical religion, and were never brought within the iron bondage of caste, where Missions have been so largely successful. Hinduism defies the tooth of time and the tool of the engineer to disintegrate it, or to pick out a stone from the hard and compact structure, except in a few rare and exceptional cases, and the intensity of passion with which these few conversions are felt and resented shows how perfect is the unity of the body—"If one member suffers all the members suffer with it." When Hinduism falls, it will fall as those grand old towers fall which have outlived the age and state of society for which they were constructed; so strongly cemented that they will stand or fall entire—they cannot be taken down like our frail modern structures, stone by stone.

"It is only by the slow and persevering process of sapping and mining that they can be brought to the ground, and they fall in one solid mass. It is thus that this great donjon, in which superstition and caste have kept the millions of India as

*Mr. Johnson, therefore, is clearly only referring to Missionary Colleges and not Native Institutions for the development of which Messrs. Roberts and Miller have recently begun to manifest such unmarvellous zeal.

in a castle of despair, will one day fall, "to rise up more at all." A thousand agencies are at work to undermine it, secular and religions, and we wish them all God-speed; but none can compare with the full and clear proclamation of the glorious gospel in thoroughly equipped and efficiently conducted educational institutions, in which Divine light is thrown on every subject of human study, by generous and disinterested men of the highest culture and Christian character."

Now, we shall presently prove by unimpeachable evidence that natives would not at present found Colleges of their own, and the Rev. J. Johnston knows the fact as well as we do. If the quotations above given be read in the light of this fact, what, we should like to know, becomes of the ingenuousness either of the Rev. James Johnston, or of the so-called "Council on Education" which he represents?

The *Hindu Patriot*, in dealing with the *Queries*, the answers to which form the principal portion of the contents of the Secret Pamphlet, hits the right nail on the head thus:—

"The wish is, we verily believe, to obtain larger lumps of the tempting cake of the educational grant, and hence the cry. Already, school for school, the missionaries obtain much larger grants than the natives, and if the Government Colleges could be knocked on the head, there would be more money available for Missionary Colleges. Those Colleges have been established expressly for the suppression of the dearly loved religion of the people, and the plan is to make the people pay, through the Government, the cost of the engines that have been set up for its overthrow. The Government cannot openly sanction grants for the support of Christian Missions, but under the guise of grants-in-aid to schools the matter may be easily and conveniently managed. The missionaries know this well, and they have set up their good-natured, religiously-disposed friends in England and Scotland to lend their names to this movement, which is purely missionary, and designed solely for the advancement of Missionary schools at Government cost. The "Council" is the mask, and the missionaries, as represented by Exeter Hall, are its wearers. We cannot, we must frankly confess, accord our sympathy to this unholy agitation."

Mr. Johnston and his fellow "Councillors" claim to be animated by purely philanthropic motives. The

following passage occurs in the Reverend gentleman's reply to the Maharajah of Travancore, explaining the aims and objects of the "Council":—"Surely there is no necessity for seeking for a hidden motive for men endowed with ordinary feelings of philanthropy desiring to spread the blessings of education among the millions of India." Let the reader read, mark, learn, and inwardly digest the following passages from the Rev. J. Johnston's "Our Educational Policy in India" (the italics are ours). p. 8:—

"With his (the Hindu's) primitive notions, he would have preferred to be ruled by a people whose God had given them power to subdue them, and if the Government exercised in his name, had been from the first wise and tolerant and just, we would have gained his obedience and respect, if not his affection and confidence. But this, I fear, is not now a practical question. It is vain to hope for any radical and beneficial change in *present circumstances*. It would now excite a not unreasonable suspicion to introduce a change, without *some adequate and obvious grounds* for an alteration of policy. *Circumstances may arise to justify such a step*, but as I cannot see how they can arise, *except through another revolt, or some justification of a great display of our power, and a call for a fresh proclamation of our authority*, I dare neither desire nor advocate such a change. I could not avoid asserting the principle, both because it is sound in policy, and because of its bearing on the question of education."

"There is a great leavening process going on in Hindu thought and feeling. There is a conviction diffused that the Christian system is the true, and will be the triumphant religion in India. *There will be opposition, there may be a conflict, imperiling our rule, if not our existence, in the country, ere that triumph is attained, but it will come, and it will, we believe, come with a sudden and mighty rush which will startle and amaze an incredulous age.*" p. 54.

These passages, of course, read together, mean nothing more than that it would be a capital thing to have another Indian mutiny that Christianity might be propagated by the edge of the sword. But, may we ask, is this philanthropy?

III. The Missionaries claim that, while advocating the withdrawal of Government from the

educational field they are the champions of all aided and independent education, whether missionary or other, but these claims are repudiated by the whole native community of Southern India.

The Rev. W. Miller, in the course of his examination of Mr. V. Krishnamachariar, a Trustee of Pacheappa's Charities, who appeared as a witness before the Education Commission at Madras, put the following question, and received the following reply :—

“ Q. 18. May I ask whether you are aware that in all their repeated appeals against the policy of the late Director, the Council of the Christian College regarded themselves as fighting the battle of all aided education, that of Pacheappa's College no less than of their own ; and that next to securing fair play for their own institution nothing will give them so much pleasure as to help in securing the most liberal legitimate aid for all native effort, and most of all for Pacheappa's College as its most distinguished and most honourable example ?”

“ A. 18. I am *not* aware of it.”

On the other side we have the following evidence :—

(a.) The subjoined passage occurs in the evidence (p. 3) given before the Education Commission at Madras by the Honourable Mr. Justice T. Muttusami Iyer, c. i. e., of the High Court, Madras :—
“ As to the proposition that Higher Education may be transferred to private agencies, these must be either indigenous or missionary agencies, as to the former they have not yet come into existence, and as to the latter, they have no legitimate place in a scheme of national education ; and further, they carry no guarantee of permanency.”

(b.) We will next quote in regard to this point a passage from the address presented to Dr. Hunter by the Trustees of Pacheappa's Charities, p. 2 :—

“ We last year applied for an increased grant in strict conformity with the rules now in force, and while our application has met with no consideration, an additional grant of more than double the amount of the whole grant received by Pacheappa's High School has been recently given to a neighbouring institution conducted by foreign missionaries. Whatever may be the justification of such

treatment, we venture to urge that a system of national education high or low, cannot be, and ought not to be made dependent on foreign missionary effort, and supported by the chance liberality of foreigners, and much less ought it to be dependent on, or connected with, the propagation of a foreign religion."

(c.) That influential body of native gentlemen, known as The Madras Native Association, say in para 2 of their address to Dr. Hunter :—

"As we believe that the Educational Department in this Presidency has been unjustly charged by some of the conductors and supporters of Mission institutions with having shown undue preference to Government institutions as against aided institutions in violation of the policy laid down in the Despatch of 1854, we desire to bear emphatic testimony to the fact that it has never been the aim of the Department to supersede or suppress private agencies that deserved to be helped and encouraged, and that its action has been mainly on the lines laid down in the Despatch. It seems to us that the assailants of the Educational Department assume that the intention of the Despatch was that a number of Government institutions should once for all be established and that thenceforward the efforts of the department should be directed towards reduction of State expenditure on them by converting them into aided institutions, and they point to the increase of expenditure on Government institutions as conclusive proof of their position."

(ā) Mr. Krishnamachariar says at page 10 of his evidence:—

"Notwithstanding the reiterated assertion of the Missionaries that it is not their aim and wish to replace Government institutions by their own, but to have them handed over to the management of Boards of Hindu gentlemen, yet their uniform practice has been to have all such institutions transferred to their own management. As a matter of fact there are hardly any stable organized bodies of native growth such as are contemplated by the Despatch, and there cannot be for a long time to come; but even if there were, the whole previous policy of the Missionaries shows that they would still continue to accept and press for the possession of a monopoly of education in the land, pleading that they are private "local" agencies.

IV. It is asserted by the Missionaries that the education given in Government Institutions is irreligious or godless in its character, and that it produces hostility to all religion; but this is emphati-

cally denied and proved to be false by less prejudiced observers.

(a) The Rev. W. Stevenson, Secretary, Free Church of Scotland Mission, Madras, says at p. 19 of his evidence :—

“ Religious faith is a matter of free conviction, and when a Government recognises this, acknowledges religious faith as beyond the sphere of its control and leaves the various religions to their own truth and vitality, then it acts upon the true principle of religious neutrality. But if it ignores the very existence of religion and occupies a sphere in which religion should naturally find a place, but is excluded from it, then Government takes up a position practically antagonistic to all religion, and violates the most fundamental principle of religious neutrality. This is the position which the Government of India at present occupies in the sphere of education, and which it must continue to occupy so long as it is a direct educator. In order to be impartial towards all religions, it teaches none ; but in teaching no religion while yet it teaches other subjects, it proves itself practically hostile to all religion. This is not a matter of theory, but of actual experience. The influence of Government colleges and schools is felt by the earnest part of the native community to be anti-religious, and as being so, to be fraught with serious danger to the best interest of the social body.”

(b) The Rev. J. Johnston says at p. 15 of his introduction to the second edition of “Our Educational Policy in India” :—

“ When I call attention to the fact, that education in Government Colleges leads to irreligion, discontent, and disloyalty, let it be distinctly understood that I neither lay the entire blame on Government Colleges for the effects produced nor do I exempt other colleges from producing, in many cases, like results.”

(a) On the other side we have the following valuable testimony of the Hon'ble Mr. Justice West of Bombay :—

“ It is a matter of common observation that the generality of people placed in a new country amongst new associations sink in a marked degree in morality. The result occurs least amongst the most cultivated as these are the most nearly of one brotherhood everywhere, while the very manners of the uncultivated man show at once how incapable he is of self-government when released from the artificial bond of custom. Now in India propagandist teaching, even secular teaching, in a

propagandist spirit, for which in itself I have no hard word or thought, produces in no small degree the same effect as emigration to another country. The old beliefs are shaken and shattered, the new ones do not take their place. The whole mass of moral and religious associations interwoven with the abandoned creed becomes discredited; all propositions seem open to doubt; the social tie of family affection and neighbouring kindness is loosened if not broken. There needs a refounding of the broken idol, but the glow of a deep conviction is wanting. The young man's principles moulded by tradition into a kind of organism have become mere fragments; his life becomes fragmentary too, without definite purpose, without any pervading and harmonizing influence. All is hesitation, limpness, and half-resolves until the moral being, unless saved by the occupations and rough philosophy of active life, settles down into some form of feeble selfishness, or querulous dissatisfaction with things in general.

"Thus where the heathen youth is invited perseveringly to Christianity and fails to attain it, he is very apt to "fall between two moralities" with a complete indifference as to either. It is hard to suppose he can in any case benefit by this. In most cases he must suffer greatly if such be the end of his teaching. It is inevitable that religious teachers should make dogma the very corner-stone of the moral edifice; they can find the appropriate sanction for anything that is good and beautiful in human conduct only in revelation, as thence too they draw their terrors for the evil-doer. When the premises are accepted all this is constraining and logical; when they are not, it is simply ideal, or it is worse, by inducing a mock attention and solemnity while the heart and conscience are in no way moved. In such cases, the character must be moulded by examples which are accepted as real, by reasoning from premises known to be true, and appeals to those emotions which a man has as a man, not as the adherent of a creed. The dissoluteness which ensues on a disordered confluence of creeds and customs has been noticed and deplored by historians and philosophers from Plato to Lecky. Failing some sudden rapture of conversion, it is the secular teacher alone, who armed with a science unknown to earlier times, can prevent the inevitable revolution from being morally destructive. It is his function to show how on simply natural principles the present is the necessary outgrowth of the past; that the old morality was the parent of the new; that time which innovates greatly but gently links us alike to the past and the future is a ceaseless process of evolution. Here there is no violent disruption, no breaking down of the old structure, but rather a union of it with the new: a feeling of the organic continuity of human existence is produced which leads to tranquillity, and shuts out contempt by

intense personal interest in the whole history of the race. Definite instruction in duty must rest on this foundation, or on an admitted dogmatic foundation, to have any influence at all. The dogmatic foundation is not one on which a Government school can build, nor are mere principles of moral conduct learned by heart of any great efficacy in producing good behaviour. Morality in the abstract is about as effective as grammar in the abstract. The human disposition is social and imitative, benevolent and reverential. It is by enlisting these springs of conduct on the side of virtue that a living and working morality is produced, and they are to be won only by the presentation in some form of human action or suffering piercing straight to human wonder or tenderness. The plastic teacher is he who brings humanity in its noble aspects home to the consciousness of his pupils, who lives in the thoughts that he proclaims and gains disciples by his sincerity and the confidence which calls for confidence. I put this free philosophical teaching of course at what I conceive to be its best; but taking it so, it seems to be as far more influential than the other as freedom is superior to restraint. It can be accepted without misgiving; it can be applied without fear. But the Government cannot be indifferent to all that is so deeply moving the nature of its subjects. The thoughts of this generation determine the action of the next. British rule is committed to the task in India of fusing a civilization, the latest growth of time with the oldest still remaining. One means of effecting a great and abiding change would have been by a bold introduction of English institutions as capable of creating the popular force by which they would afterwards be supported. Another means would have been by asserting a complete predominance of English force. We have shrunk from that odious responsibility, but having done so, we, that is the Government, must brace itself to the task which a noble policy has entailed. It must endeavour to make itself felt through the whole scheme of the nation's development in such wise that this may be always advancing yet without abnormal growths and without estrangement from existing institutions. Of all men, therefore, those who govern in India will be the most short-sighted if they leave the great moving forces of the future to the impulse of mere chance. They must guide the movement through the education of the people and they must fit themselves to guide it aright on a secular basis."

(b.) The Honorable Mr. Justice Muttusami Iyer of Madras says in his evidence, in answer to the question, "Does definite instruction in duty and the principles of moral conduct occupy a place in the

course of Government Colleges and Schools? Have you any suggestions to make on this subject?—

“No. I may, however, add that a strong sense of duty and a higher tone of moral conduct have practically resulted from the secular instruction afforded in Government Colleges and Schools. This is the testimony uniformly borne by men who have a practical knowledge of the country as it was 40 years ago and as it is at present.”

(c.) Professor Lethbridge at p. 81 of his very able book on “High Education in India” writes:—

“And with regard to the moral teaching that is conveyed in Government Colleges, I will venture to quote some remarks that appeared in the *Hindoo Patriot*, of March 24, 1873, on a letter addressed by me, in that year, to the *Friend of India* on the subject:—

“Professor Lethbridge has addressed an excellent letter to the *Friend of India* on the subject of moral teaching in Government Colleges. He writes:—

“That the education imparted by our College lecturer is a godless one, or devoid of moral teaching, I distinctly and emphatically deny. It is true that we do not inculcate the doctrines of Christianity; even if the orders of Government did not forbid it, I very much doubt whether our duty as Christians and as men of honor would not preclude our doing so, paid as we are from the taxation of Hindoos and Mussulmans. But I unhesitatingly assert that the spirit of religion and morality, that spirit which not unknown under other systems and other faiths, has attained its highest purity and refinement in the teaching of Christ—is not absent from our lectures; indeed I am at a loss to know how such a subject as History can be adequately and sufficiently taught by a really conscientious and earnest lecturer without some infusion of that spirit. The *Friend* cannot gainsay this fact, but takes refuge under the flimsy excuse that the Government system of Education ‘professedly and systematically ignores the religious emotions.’ But, how can the Government introduce dogmatic religion—for the essence of all religions, fear of God and love of man, is as much inculcated in the Government schools as in any professedly religious schools—without breaking its faith with the people for religious neutrality. The *Friend* wishes to throw the whole work of national education into the hands of missionaries, but he may rest assured that our Government is too conscientious to do anything of the kind.”

(d.) Dr. Duncan, of the Madras Presidency College, makes the following remarks, on the subject in the course of his thoughtful and valuable paper laid before the Education Commission :—

“ The position of moral instruction in a scheme of education is one of those vexed questions which press for answer, but in regard to which there is great want of unanimity among educationists. In this, as in the case of many other practical questions, differences of opinion with respect to the means by which the end is to be attained are very frequently interpreted as difference of opinion with regard to the desirability of the end itself. But it may safely be affirmed that there is one and only one opinion among educationists as to the desirability of the end ; the education which cultivates the intellect, while leaving the moral nature a barren waste, being admitted on all hands to be only half culture.

“ It is solely on the point of what is the best method to pursue in training the moral nature that divergencies arise among those engaged or interested in the education of the young. There are those who advocate definite and systematic teaching of the principles of morality as a branch of knowledge in the same way as other branches of the school curriculum are dealt with. I have some difficulty in forming a clear notion of what is really meant by this proposal. But if I understand it aright, I see endless difficulties in carrying it out, and even were these surmounted, I doubt whether the result would be as successful as its advocates anticipate. If morality is to be definitely and systematically taught like any other branch of knowledge, the teachers must themselves be definitely and systematically trained in the knowledge and application of moral principles ; if they are not so trained and their teaching is to depend on the moral knowledge which every fairly educated man is supposed to possess, that is tantamount to saying that the moral teaching is not, and need not be, systematic.

“ A suitable text-book is also a desideratum if morality is to take a co-ordinate place with other branches of knowledge in a school curriculum. Suggestions have been made in various quarters as to the preparation of such a moral text-book. I am afraid that those who have set such a task before them will not find it a light one. The proposal to prepare a systematic text book of morality, so simple as to be intelligible to the capacities of school-going youth, and so catholic as to commend itself to the minds of all connected with education, appears to me Utopian. But the form which such a book would probably take would be that of a sort of moral anthology, in which moral examples culled from all available sources would be brought together so as to form a Moral Reader. Such a book would doubtless be very valuable and interesting in its way, but I am afraid it would not produce a homogenous impression on the youthful mind. This moral kaleidoscope would be apt to leave in the mind a shifting phantasmagoria of virtues and vices, of duties and obligations, which would be of small service in the affairs of life.

“ We must also be prepared to face another consequence of the introduction of a moral text-book whether in the form of a systematic treatise or in that of a moral anthology. No sooner will

morality have been taken up definitely and systematically as a constituent part of our school curriculum, than a place will have to be made for it in our scheme of examination. Now if the examination be on the theory of morality merely, the end for which definite and systematic instruction in morality is sought will not be obtained. For a theoretical knowledge of ethics has neither less nor more value than theoretical knowledge of any other kind. If the examination be on practical morality, a genius will have to arise to teach us how moral character is to be valued by percentages of marks without the life and soul of it vanishing completely. It is difficult enough to estimate the growth of intellectual acquirements by written examinations, to value moral acquirements by the same means is impossible. It has long been a truism among educationists that when the best has been said in favour of public examinations, it must still be admitted that they fail completely to touch those subtler effects of school life—the development of the moral and spiritual elements of character. Of this, however, we may rest assured, that if moral training becomes a definite and distinct portion of the school curriculum, a demand will arise to subject it to the ordeal of a public, it may be of a competitive, examination.

“The advocates of a definite and systematic treatment of morality being made a distinct part of the school curriculum seem to forget how the moral character of the young is developed. Moral character is the confirmed habit of moral action, and its growth in the young of a school-going age is quite consistent with ignorance of the principles on which moral action proceeds. Moreover, the introduction of a young man, towards the close of his University career, to the study of the theory of ethics is often accompanied by effects the very opposite of what are anticipated. Principles which from his earliest years he has been uniformly taught to obey and which consequently have come to be a second nature, he now for the first time, in his life, sees subjected to the same rigid scrutiny as any of the laws of the material world. Rules of conduct which he has always regarded as self-evident, necessary and universal he now sees canvassed, questioned, it may be in the end rejected. This new experience has for a time anything but a steady effect. Some come out of the ordeal like gold tried in the fire; others attain to the certainty of moral conviction only after a period of anxious doubt; while others, less fortunate, never recover their early faith in the sacredness of duty.

“I am firmly convinced that the attempt to teach morality like any other branch of knowledge as a part of a school curriculum will not prove successful in the way which its advocates anticipate. I would recommend that morality be taught in school in the way in which it is taught at home and in the social life of the young. In the life of every child and young person there are ample opportunities of inculcating all the fundamental duties as they actually arise in daily life. This is not the place to enumerate the various means adopted by parents and guardians to form and foster the character of those committed to their care. Suffice it to say that, along with precept and example harmoniously combined, there go active checking of wayward tendencies as they actually arise and willing assistance rendered in helping to overcome the difficulties that at first beset the path of duty. It is to the daily actual exercise

of the virtues, to the actual performance of concrete duties, that we look, and must look, as the chief means of forming moral character. To this daily practice in duty, example, precept and theoretical knowledge are only auxiliaries.

"It is, therefore, to the actual exercise of the virtues and the actual performance of duties, that I would look for the formation of moral habits. And I maintain that this can be done as efficiently by means of any ordinary school curriculum as it could be after the introduction of the systematic teaching of morality as part of the school course, with the addition of moral text-books and moral competitive examinations. The teacher who cannot, within the ordinary school life, find the means and the opportunity of developing the moral character of his pupils, may rest assured that he has mistaken his profession.

"An opinion is abroad that facilities for moral training exist in aided, and especially in mission schools, which do not exist in Government schools—that in fact the cultivation of the moral nature is and must be excluded from the latter, and remains the peculiar monopoly of the former. To the epithet "godless," so freely and indiscriminately applied to Government institutions, many people add as a necessary corollary the epithet "immoral." But, in my answer to Question 60, I have endeavoured to shew that the really vital part of religion is no more excluded from Government schools and colleges than from those managed by the different theological sects. Whether or not the religious nature of the young be properly unfolded in Government establishments depends principally on the qualifications of the teachers; and who will deny that the same is not the case in mission schools? Consequently it may, and I believe often does, happen that pure and undefiled religion is in a healthier condition in the former than in the latter.

"But what I am here concerned with is not to adjust the comparative merits of the two classes of schools, but to defend Government schools and colleges against a charge bred of ignorant prejudice and fostered by sectarian animosity. And if on this subject I speak strongly it is because I feel strongly. To try to gloss over a matter of such moment with soft plausibilities and smoothly turned phrases would be to neglect a plain duty I owe to the Government which I serve, and to the people of this country whose welfare I am paid to promote. Now I cannot conceive it to be for the best interests of the people of India that they should be dragged into that mêlée of theological asperities and religious animosities characteristic of European ecclesiasticism; and that too at a time when theological dogmatism and sectarian bitterness are gradually dying out in the West. To casual observers it may appear as if no such danger threatened India; but any one who looks below the surface must see that the different sects of missionaries, with one or two remarkable exceptions, while seemingly united in their opposition to a so-called system of secular education, are secretly consumed with mutual jealousies, which require only the abolition of Government schools and colleges to burst into flame.

"The allegations that Government institutions are forbidden to cultivate the religious nature of the young, and that, as a consequence, they cannot and do not develop the moral nature, I look upon as misleading and mischievous. To shew that the latter allega-

tion is untrue I have to appeal to the *Standing Orders* of the Educational Department of this Presidency, which are binding on almost all Government schools. In the *Standing Orders* moral training is distinctly laid down as a matter demanding the earnest attention of the teacher. Now, putting aside the supposition that this subject has been introduced by the Director merely for the purpose of making a show of virtue which the Government system does not and cannot possess, there remain two alternative hypotheses: either that the teachers wilfully treat this provision of the *Standing Orders* as a dead letter, or that there are difficulties in the way of carrying it out in a Government school which do not exist in a mission or aided school. The former alternative, though not unfrequently thrust in a sneering way in the face of the officers of the Department, does not deserve a moment's serious consideration. The latter alternative, being the one adopted by many highly estimable people, Native as well as European, is worthy of careful enquiry. The obstacle which is supposed to stand in the way of moral training in Government schools is the absence of religious teaching. That the educational officers of the State should be debarred from teaching religion appears a sufficiently bad state of affairs; but that they should, as a consequence, be prevented from inculcating the truths of morality, if not worse, in the abstract, appears to be more dangerous on account of the important practical consequences. For, this latter disability, if it did exist, would imperil the whole fabric of society; and in that light it is viewed with grave anxiety by many thoughtful Natives of this country, Hindus and Muhammadans alike. To relieve such anxiety I repeat, firstly, that the aspect of religion which bears upon morality is no more excluded from Government schools and colleges than from any other; and secondly, even if religion were excluded, opportunity and scope would still remain for the teacher to develop the moral character of his pupils. Nobody worth listening to will now-a-days contend that the fundamental principles of ethics rest on the theological dogmas peculiar to any particular sect. The best moralists of all ages and creeds have held that morality does not rest on any dogmatic theological basis whatever. So that, in being debarred from inculcating any theological creed, Government educational officers are merely prevented from teaching something which is not essential to morality. It is the emotional element in religion which comes into close relation with moral action. A virtuous life implies an habitual impulse or motive to do right and abstain from wrong. This impulse or motive is made up of feelings of various kinds. In fact there is no emotion of the human breast which may not become a minister of good. Here we have the true answer to the question—in what relation does morality stand to religion. Religion (meaning by that term, not the body of theological beliefs, but the aggregate of feelings called up when we contemplate the Deity and our relation to him) is one of the most powerful among the diverse motives of human conduct. And as I have endeavoured to show, there is nothing in the constitution of Government colleges and schools to hinder the teacher from fostering the growth of genuine religious feeling in his pupils, and nothing, therefore, to prevent his appealing to those religious feelings as one of the sanctions

of moral conduct. Whether this be done or not depends, as I have said, on the personal character of the teacher: and this is as true of mission institutions as of Government schools. Nor must it be forgotten how large a part of morality is concerned with the relations of man to his fellowmen. I have spoken of the religious feelings as constituting only *one* of the sanctions of morality; for we must not ignore the efficacy of other feelings as motives to right conduct. Among those other feelings are to be reckoned those which regard self and those which regard our fellowmen. So that, even were he precluded from appealing to the religious feelings of the young, the teacher in a Government institution would still have the wide field of personal and social interests to work in; and who will say that to work this field thoroughly and well is not arduous enough to tax the energies of the best of men, and efficacious enough to train up a nation of wise and good citizens? Fortunately, however, Government educational officers have the same commission as others, namely, to train the moral nature by appealing to every feeling of the human heart, to the religious feelings no less than to the personal and social. To prove that they have not been altogether unsuccessful in the performance of their task, I appeal to the most convincing of evidence—to the stainless and upright lives of the many men all over India who have been trained in Government institutions, and who, as respects moral character, need not fear comparison with the educated classes of any country.”

(e.) Dr. W. H. Wilson, Professor of Physical Science, Presidency College, Madras, says at p. 6 of his evidence:—

“There is not an intelligent and unprejudiced native in this Presidency who does not scout the pretensions to the possession of a monopoly of moral teaching which certain missionaries lose no opportunity to urge, especially in distant lands and before sympathetic audiences where there is little fear of contradiction, who does not deride the notion of Missionary Colleges producing men in any way better or more moral than those trained in Government institutions. If there be any difference in this respect, the superiority will I imagine be generally conceded to the men whose education was received in the “godless” colleges; those colleges whose existence we have been told is a peril to the country, and which are training up a race of Atheists such as the world never saw. In purity of life, in rectitude of conduct, and in conscientious discharge of their public or professional duties, the men thus calumniated, are admitted to be excelled by none, certainly not by those for whom so vast a superiority is claimed. Much sympathy has been enlisted for Missionary enterprise, and much hostility towards Government education created, by accusations of this nature, and though easily refuted in this country, it is more difficult to meet them when made in Europe. Indeed it is impossible to counteract the evil effect they produce, as these charges, through persistent reiteration, obtain a much wider circulation than their denial ever does.”

(f) H. H. The Maharajah of Travancore, a thoughtful and worthy representative of native ideas, says at page 7 of his "Letter to Mr. Grant Duff" :—

"I do not comprehend the truth of the remark that the education at present given in Government schools and colleges has reared a race of atheists. Surely it has been powerfully instrumental in sweeping away the dross and scum of every religion. But it has not extinguished, it cannot extinguish, that instinctive desire which exists in every human being to know the unknowable and to define the infinite. The most out-and-out atheist, who prides himself in his atheism and drags atheism to his aid, must have at times felt in his inner man the sore need of invoking a Superior Power and a Superior Dispensation. Good and sound secular education can never harm this religious instinct; but, on the other hand, it makes a man better fitted to think correctly and to seek the truth diligently. There is no dearth of religious teaching in India. It can be had for the asking, and often without the asking. I can with confidence affirm that there is an honest yearning in the minds of most educated natives after a religion. They have all the materials before them, and they may be left to make their choice."

(g.) Mr. Lethbridge in his "High Education in India," (p. 124) says :—

"At present, in the many famous Missionary Colleges of India, the teaching is most efficient in the highest branches of Mathematics, of Philosophy, of Natural Science, of the whole "profane" learning of the Universities; but in the matter of religion, General Tremehere has shown that a little perfunctory Bible reading for perhaps an hour or less each day is all that is ventured on—and it has been stated that the proved conversion of one of the students would probably have the effect of emptying the College to which he belonged."

V. The Missionaries and the "Council" wish the Government to withdraw from the direct management of education in order that the power and importance of the Missionary Colleges and Schools may be augmented largely and at once, and that wider opportunities may be afforded the Missionary Societies for uprooting the religious beliefs of the people of India and converting them to Christianity.

(a). The Revd. J. Johnston in "Our Educational Policy in India" (Introduction p. iv.) says :—

"Christian educationists saw that if the provisions for aiding equally Native and Mission Schools and Colleges, as was most explicitly promised and provided for in the Despatch, were faithfully carried out there would be no difficulty in the way of the rapid and almost indefinite extension of Christian instruction ; not by asking any special favor for their institutions over those of the natives ; not by any forcing of Christianity by Government authority ; but by the natural and laudable method of providing the highest form of education in secular studies, along with the knowledge of Divine truth and the love of God, which commend themselves to the understanding and heart even of the heathen when taught in a loving and sympathetic spirit."

Again (Introduction p. 15.)

"A weak objection is made to the proposal to withdraw the colleges supported by Government, on the ground, that if the Natives came forward in any force to supply their place, the effect would be the same, as the higher education necessarily overturns their heathen systems, based as they are on physical errors.

"But surely there is a vast difference between undermining the religious beliefs of the heathen by Government Officials, in Government Colleges, paid out of Government taxes derived from a heathen population, and the heathen upsetting their own creed, in their own colleges, by teachers of their own choice."

In the same pamphlet at p. 53 occurs the following :—

"Another point of great importance is to see that such a staff of Professors and Teachers is kept up, as shall admit of greater attention being paid to Evangelistic work in the colleges and amongst those who have passed through our educational institutions."

(b) The Rev. Dr. G. U. Pope, in a paper on "India as a Field for Christian Missions," read at the York Missionary Conference in July last, gives a fuller and more forcible exposition of the Missionary views and aims in this matter, thus :—

"But what I desire especially to urge upon you at this time is the opening now afforded for the Propagation of Christianity in India by means of Christian schools and colleges. A volume might be written upon the subject. How superficially it must be treated in a twenty minutes' paper! You know how ably

this work was inaugurated by Dr. Alexander Duff of Calcutta, followed in Bombay by Dr. John Wilson, and in Madras by Mr. Anderson ; carried on ever since by men hardly inferior to these pioneers ; and now, especially in Madras, conducted in the " Christian College " under Mr. William Miller ;* in Masulipatam by worthy successors of Noble and Fox ; and in various schools and colleges maintained by the Venerable Society for the Propagation of the Gospel in Foreign Parts aided by her Venerable Sister, the Society for the Promotion of Christian Knowledge, by the Church Missionary Society, ever ready to engage in any good work, by the Scottish Presbyterian Boards of Missions, which send out generally men of distinguished ability, by various congregations of Jesuit Fathers, in Calcutta, Bombay, Negapatam, and elsewhere, by the Wesleyan Missionary Society, by the London Missionary Society, and by others whose work is in various degrees valuable.

" This work so variously carried on (with many defects and anomalies, with much waste of power from lack of oneness) I regard as by far the most hopeful and far-reaching of all our missionary operations, and I desire to see the day when all the centres of Hindu life shall have Christian schools of every grade and colleges established in their midst.

" These institutions are commended to us by the fact that they are largely self-supporting after a time ; since Native students are generally able and willing to pay adequate fees where the English teaching is first rate, while the Government is ready to give liberal grants-in-aid, without in the least degree interfering with the liberty of the teachers to inculcate Christian truth.

" To return : the masters, if men of ability and especially if of University distinction, are constantly appointed examiners in the various Indian Universities ; and are among the most influential Fellows of those universities ; and are really great powers in the places where they labour : *Christ powers in a heathen land.*

" It is, however, very desirable that they should be men of mark, so as to give a *status* to our Christian Colleges.

" The curious mistake has been not unfrequently made of sending to such work trained schoolmasters, not animated by any Missionary spirit ; and even of relegating to this all-important work men who, for any cause, were not considered eligible candidates for Holy Orders. Thus, we have had, and we now have, many moderately successful schools without any appreciable or distinct Missionary effectiveness : large salt heaps without savour. Many have found themselves sitting in Duff's seat,

* The High Churchman, it may be remarked, refuses the title of *reverend* to the presbyterian parson.

with but a very moderate portion of his remarkable ability, and still less of his burning and apostolic zeal. With such (nominally) Mission Schools I have scant sympathy, and I look upon them with but the faintest hope of benefit in a Missionary point of view.

“A reform is needed, especially in the schools of our own Church of England Missions.

“Every such institution, I submit, should have at least two able and zealous Missionaries at its head, one as principal of the department, and one devoting himself to direct Missionary work among the educated English-speaking society that gathers around it.

“Through these, others may be reached. Such Missionaries need not, at first, much trouble themselves to learn native languages, as their first and best work is in English.

“If in the vicinity of every such institution not less than two like-minded *zenana* sisters were engaged in striving to create a Christian influence in the homes of the students, to which they would have easy access, the two works combined would have a fourfold effect; then boys would be taught in college, and their sisters would be influenced at home, and they would compare notes.

“At this time the Government of India is seeking to withdraw itself in great measure from the higher education of the country; and, as India will have English education, this is a great missionary opportunity.

“Only let me repeat, second-rate men must not be sent out for this work. It requires the best men. It is full of interest and promise for them; it is quite worthy of them. The institution will soon become self-supporting; and the salaries given (though a missionary must not go out for his salary) should be such as to place them beyond all sordid anxieties, beyond all necessity of seeking for other emoluments to bring up their families respectably in the station of life to which they themselves belong.

“Having regard to the specialities of our Indian social life it is not expedient that our missionaries should be very poor men. Health is sacrificed, powers of body and mind enfeebled, life often endangered by unsuitable and unnecessary deprivations in such a climate, and in a work where the *mens sana in corpore sano* is so necessary.”

The meaning of the above, in plain English, is that now is the opportunity for Missionary Societies to step in and found colleges, and that Missionary Professors should be paid handsome salaries. Is not this worldly object then really at the bottom of a good deal of this agitation for the disestablishment of State Colleges?

Dr. Pope concludes this significant address on India as a Field of Missions and *Christian* education as their real strength, in unmistakable words thus :—

“ Let it be granted that immediate conversions even of the lowest, and even where the motives are mixed, are cause of real thankfulness : yet, I ask your sympathy on behalf of a work of ampler scope, which is, in truth, placing a mighty lever under the very foundations of Hinduism, and must overturn it in the end.”

VI. The Missionaries and the “ Council” say that the great aim of their agitation is “ to secure the faithful and vigorous carrying out of the great principles of the Despatch of 1854,” (Reply to the Letter of H. H. the Maharajah of Travancore, p. 7); but that Despatch is not framed with the intention of aiding proselytism ; and if that would be the inevitable result of carrying out what the Missionaries contend are its provisions, then every Government would be compelled to say that those provisions must not be carried out.

Now, why do Missionaries want Government to withdraw from education ? This is a very simple question, and the following quotations from the Rev. J. Johnston, the exponent of the views of the party advocating withdrawal, will to most people furnish a sufficient answer :—

“ Another point of great importance is to see that such a staff of professors and teachers is kept up, as shall admit of greater attention being paid to evangelistic work in the colleges and amongst those who have passed through our educational institutions.

“ This work must, as a rule, be done by the professors, not by a separate class set apart as evangelists. They would be looked on with distrust, and would not get the hold on old scholars which a former teacher would. Every professor and teacher must be an evangelist, who carries his evangelistic spirit into the school and college, every day, and at all times. By having a larger staff, there could always be one in turn engaged in looking after, and addressing as occasion offered, old graduates

of their own or Government colleges in the towns and by occasional itinerancy in the surrounding country for scattering the seed of the word where it may fall into the hearts of old pupils and recall old lessons. (p. 53).

“When Hinduism falls, it will fall as those grand old towers fall which have outlived the age and state of society for which they were constructed; so strongly cemented that they will stand or fall entire—they cannot be taken down like our frail modern structures, stone by stone. It is only by the slow and persevering process of sapping and mining that they can be brought to the ground, and they fall in one solid mass. It is thus that this great donjon, in which superstition and caste have kept the millions of India as in a castle of despair, will one day fall, “to rise no more at all.” A thousand agencies are at work to undermine it, secular and religious, and we wish them all God-speed; but none can compare with the full and clear proclamation of the glorious Gospel, in thoroughly equipped and efficiently conducted educational institutions, in which Divine light is thrown on every subject of human study, by generous and disinterested men of the highest culture and Christian character.” (p. 55.)

The advocates of the abolition or transfer of State colleges habitually refer to para. 62 of the despatch as the authority they rely upon. The paragraph runs thus, and the particular attention of the reader is requested to the portions we have italicised:—

“We look forward to the time when any *general system of education* entirely provided 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 order may be *safely* closed, or transferred to the management of *local* bodies under the control of, and aided by, the State. But it is far from our wish to *check the spread of education in the slightest degree by the abandonment of a single school to probable decay*; and we, therefore, entirely confide in your discretion, and in that of the different local authorities, while keeping this object steadily in view, to *act with caution*, and to be guided by *special reference to the peculiar circumstances* which affect the demand for education in different parts of India.”

That the interpretation put on this paragraph of the Despatch of 1854 by the missionaries is a perverse one, is plain from the following extract from a subsequent explanatory despatch of Her Majesty's Secretary of State to the Government of

India, No. 6, of the 14th May 1862, which strangely enough has been kept in the back ground in the Missionary controversy all this time :—

“ Her Majesty’s Government are unwilling that a Government school should be given up in any place where the inhabitants show a marked desire that it should be maintained.”

Is not this an authoritative interpretation of a much disputed paragraph, which though perfectly clear to all unprejudiced minds and past Governments, has been wilfully contorted for vain and selfish ends by those whose aim is to make capital out of the educational agitation in India? And has not Her Majesty’s Government in this latter despatch pledged not only itself but the Government of India to an educational policy directly contrary to that of the Missionaries and the “ Council ?”

This explanatory despatch of 1862 seems to us in the present state of matters to be a document of the first importance, and the only conclusion that can be drawn from it, and from the summary of the objects of the great Despatch given in para. 6 of the Resolution of the Government of India constituting the Education Commission, is that not only the maintenance of State colleges and schools of the higher order, but also the increase of their number when necessary, was contemplated ; and wherever the need was felt, and spontaneous local efforts could not be entirely depended upon for the establishment and efficient maintenance of private institutions, it was the obvious duty of the educational authorities to start and maintain on an efficient footing Government institutions out of the taxes paid by the native population, as an integral part of a complete scheme of national education for India.

If this conclusion is sound, then it is plain that it was a most unjust and uncharitable act of the Rev. J. Johnston and his “ Council ” in England, and

of certain Missionaries in Madras, to misrepresent the action of Colonel Macdonald and other educational officers as an unauthorised deviation from the principles of the Despatch of 1854, and to attack them personally for having honestly stood firm to the distinctly defined policy of Her Majesty's Government, and deprecated the closing of Government schools and the replacing of them by foreign Mission schools according to the missionary scheme.

If any one is still in doubt as to the inaccuracy of the missionary interpretation of the educational Despatch of 1854, we think his doubts will be removed by a perusal of the following examination of the disputed paragraph in that despatch by Mr. Lethbridge, at page 42 of his work on "High Education in India":—

"The Despatch further looks forward to the time 'when many of the existing Government institutions, especially those of the higher order, may be safely closed, or transferred to the management of local bodies under the control of and aided by the State.' Now, many people will be surprised to find that the sentence I have here quoted is the *only one* (except a cursory reference in Section 86) in the whole despatch that can, by any stress of interpretation, be held to give even a shadow of foundation for the theories of the abolitionists; and a careful examination of the context will show (1) that no reference whatever is here made or intended to the State Colleges, and (2) that no other educational institution of any kind is to be abandoned or transferred, unless its place can be fully and adequately supplied. The authors of the Despatch distinctly say, in the very next sentence, 'it is far from our wish to check the spread of education in the slightest degree by the abandonment of a single school.' They say nothing whatever, in this connection, of the Colleges. I shall show, that the exact functions of the State Colleges cannot possibly be *fully and adequately* performed by institutions conducted or controlled in any other way."

VII. It is asserted by the Missionaries that, were Government to withdraw from taking a direct part in education, and carry out the Despatch of 1854, as interpreted in their own way, native agencies would

at once supply its place in the educational field ; but we scout the idea in common with others who have an intimate acquaintance with the country, and its real wants and protest in the most emphatic manner, against the withdrawal of Government from education.

(a). The Revd. J. Johnston in the second edition of his "Our Educational Policy in India" says at p. 42 :—

"Both Mr. Kempson and Mr. Cust assume that in advocating the withdrawal of the Government Colleges we expect that the grants-in-aid are to go exclusively, or almost exclusively, to mission colleges, and against this their arguments on the ground of neutrality are telling enough. The Natives of India have a right to be fairly and even liberally dealt with in such a case; and I fully expect that they would set themselves to establish and maintain colleges and high schools, if they were left to stand alone, instead of being bolstered up by a pauperising system. They have done so before, and would do it again. When the desire for education had not a tithe of the strength it has now, the natives of India made noble contributions for education. Now it is a felt necessity, and there is no fear of the higher education going down. If the Universities are kept up, they will maintain the standard in all the higher schools and colleges."

(b) The following is from the Revd. W. Stevenson's evidence, p. 15 :—

"It follows from what I have said on the preceding question, that in my opinion the withdrawal of Government from the direct management of schools and colleges would have a most encouraging effect upon the spread of education.

"In the first place, it would be a convincing evidence that the Government really desired independent bodies to extend their operations, evidence which they are much in want of at present. Not only do missionary agencies feel that they are under the present system heavily handicapped and discouraged, but independent native gentlemen are deterred from opening schools which might be regarded as rivals to Government institutions. I have, for example, very good authority for stating that the College Department of Pacheappa's Institution would have been developed sooner and further than it is, had it not been that it would thereby appear to be a rival and possible substitute for the Presidency College.

“Further, were Government to withdraw from direct operations, it would have considerable funds set free to encourage aided institutions, and to call forth other resources which are not at present available. Every rupee of aid given by Government calls forth another, and in most cases two, from independent managers, not to speak of the fees contributed by the people themselves. A great extension of education could thus hardly fail to be the result.

“Thirdly such withdrawal would tend greatly in my opinion to promote a spirit of reliance upon local exertions and combination for local purposes,” which the present system tends to repress. It cannot be expected that the people will step forward to do for themselves what Government is doing for them, especially when they think such spontaneous activity on their part would be the reverse of agreeable to Government authorities. It is certainly a main part of the educational influence of Government institutions to teach the people to look to Government for every thing—to expect from Government first education, then certificates, and then appointments; and to see no field for exertion or enterprise outside of the Government service. Government overshadows every thing in India, and the sense of its omnipresence and omnipotence fills the mind of almost every Educated native, so that there seems no scope, or career beyond it. The existence of a Government educational department is not entirely to blame for this, but undoubtedly it has much to do with it. In Government schools the youths are first inculcated with the idea, and early impressions are proverbially lasting. Were Government to withdraw from the direct management of Educational institutions, and hand them over to independent local bodies, a great blow would be given to the pernicious error—the mother of discontent and disloyalty, that Government is bound first to manufacture an educated class and then provide for it. Until this is done, it seems to me that the prospect of making local self-government a reality is very doubtful indeed. To transfer Government schools to independent local bodies would be the most effective step in this direction. Education is a field in which the spirit of reliance upon local exertions and combination for local purposes can be most safely and wisely developed. I have no doubt also that if a stimulus were once given to a spirit of loyal freedom and active enterprise, it would manifest itself in many directions, and in due time develop the resources and promote the prosperity and wealth of the country.”—

But in reply to these statements, we will quote the following native opinions and evidence of gentle-

men who know India well and sympathise with its people :—

(a) His Highness the Maharajah of Travancore in his published "Letter" to the Governor of Madras writes at p. 5 :—

"To argue therefore that the cause of higher education, which thrives in England independently of all State support, could be well left to private agencies in the case of India, is to argue from false analogy. The time may come when the chiefs and well-to-do men of India, themselves benefited by higher education, will contribute to it in such a manner as to relieve the Government of the obligation. That there is such a tendency is evident from the Colleges and High Schools that are springing up in Native States and the scholarships founded by native chiefs and native communities in Government Colleges. It is very necessary to encourage such a tendency ; and nothing can have a more disastrously opposite effect than the withdrawal, at the present stage, of Government connection with higher education, which is certain to be construed into a public condemnation of it."

"In answer to this it is, I believe, urged by the Christian Missionaries and their friends and supporters that if the Natives of India will not, in their own interests, maintain higher education, the Christian benevolence of England is ready to do it for them, and that with the additional advantage of giving a sound religious tone to that education. I do not for a moment underestimate the valuable service which the earnest and self-denying labors of the Missionaries have done to the cause of education in India. Nor do I undervalue a greater religious leavening of education in India. In his excellent University address, every word of which will long be remembered, and in which the outpourings of an earnest and loving heart at times unconsciously overflow the limits of strict official bounds, the Viceroy, Lord Ripon, regrets the absence of the religious element in the present system of State education. In this regret all thoughtful men must cordially agree. At the same time, His Lordship most justly observes that a Government ruling over millions of alien people of diversified creeds cannot take any action to rectify this. To withdraw from the present system of directly supporting higher education and to entrust it to Missionary agencies is sure to be attributed, reasonably or otherwise, to a desire on the part of Government to force Christian teaching upon the people. The reluctance to be educated in Missionary Schools may be less manifested by Hindus than by Mahomedans, Parsis, Sikhs, &c., but all must share it to a very great extent. In this remark I refer to the higher classes especially."

(b) Mr. C. Runga Charlu, C. I. E., Dewan of Mysore, whose enlightened views and wide experience are well known, says in his speech at the Anniversary of the Maharajah's College, on the 24th March 1882 :—

“The questions which are being now discussed in connection with education are how far Government can be relieved of the cost of higher education and how the education of the masses at large can be extended. You may have seen that the enlightened ruler of Travancore, who has an extensive knowledge of educational matters, has already sounded the note of warning against the adoption of any suicidal policy in respect of higher education. There is a general feeling amongst natives, and I may add amongst those European gentlemen who have most laboured in the cause of education with a love for the people, that high-class education is not viewed in a proper light. The idea of placing higher education and the education of the masses in antagonism with each other has not, as you are aware, originated with the natives of this country. It has been put forward by a deputation in England, who are, it is believed, influenced by the missionary bodies here, who desire to take the management of higher education into their own hands. This, I need hardly say, is simply impossible in the circumstances of India, and it is to be regretted that by this move our missionary bodies, to whom the country owes so much in the matter of education, should have needlessly exposed themselves to the distrust and dissatisfaction of educated natives. But you will have seen that the resolution of the Government of India on the subject indicates a desire to make over the educational institutions only to native gentlemen, when they are prepared to take charge of them. *It would have been better if this idea was not put forward at all, as natives are not, and will not for a long time to come, be ready to take charge of high education, and meanwhile the suggestion might unsettle the management of these institutions. Even if competent natives could be found, how could these really public schools be handed over to them any more than to missionary bodies, without giving rise to serious objections in other quarters ?*”

(c) In his speech at the Convocation of the University of Madras, held on the 23rd March 1882, Mr. Justice Mutusami Iyer clearly set forth the views of the Hindu community when he said :—

“Doubtless the ultimate state of things to be aimed at in regard to higher education would be a model college in the Presidency town, supported by the State, forming as it were a

focus of intellectual life, and having on its staff professors of eminence, who are in themselves the living embodiments of the highest forms of culture. No expense would be spared by the State to maintain the instruction imparted in such an institution at the level of attainable perfection. Such a college the ordinary laws of demand and supply cannot be trusted to bring into existence. In the provinces would then spring up colleges supported by the nobility and gentry and an enlightened middle class fully alive to the advantages of liberal education, and able and willing to make large sacrifices for securing it to their children. These colleges would necessarily be influenced by the high standard maintained at the Government College, but not enslaved by it; they would provide for a variety of forms of culture, according to the importance attached to the several branches of knowledge or method of instruction in the communities among whom they come into existence. *Admitting that this should be the final aim, I must express my conviction that the day is yet distant when such a state of things may be expected in this country.* Those who have benefited by the encouragement accorded by the State to higher education hitherto, have not been the zemindars and the landed aristocracy of the country, so far at least as this Presidency is concerned, and there is no such sharp distinction between the rich and the poor in this country, as is said to exist in European countries, and intelligence and refinement do not co-exist with wealth to the extent that it does elsewhere. *It is to be feared, in the present circumstances, if the State aid be suddenly withdrawn, any movement to replace it out of the private wealth of the country would not be successful in most cases. Higher education will have to be practically left in the hands of missionary agencies, in no sense indigenous.* I do not in the least undervalue the important services which they have rendered to the cause of education. But if all higher education is virtually committed to their hands will it conduce to the variety of culture and the adaptation to the special needs of the country upon which so much stress is laid, in recommending the withdrawal of State support to higher education? However this may be, it would certainly seem anomalous that, in a country composed of many nationalities, Hindus, Mahomedans, Buddhists, we should trust for the provision for higher education which has such an important influence on national progress, not to indigenous agencies, which there is reason to fear will take time to come into existence, not to the private wealth of the country, a considerable proportion of which still remains to be brought under the influence of culture, but to the benefactions of charitable men in England and foreign countries, contributed for a special purpose, and to their willingness to permit such benefactions to be applied for the purpose of secular education. Apart from

other objections, such a system will be without the guarantee of permanence and stability, which is essential to a scheme of national education.

[d] The Revd. N. Rondy, of Coimbatore, says in his evidence, p. 3:—

“Is the time come for Government to give up its colleges and schools?”

“I beg to quote the words of a most influential native gentleman on the subject: ‘It would have been better if this idea was not put forward at all for the suggestion might unsettle the management’ of the already existing institutions.

“The present state of India is, it may be said, a transitional period. The Indian people begin to shake off the chains of routine and to throw away many of their prejudices. It appears that the time is come for Government, in order to reap the most precious fruits of the liberal education they have afforded to the natives, to exercise a proper control over this awakening of the Indian people. How will Government control it if not by education? A native gentleman said lately that ‘the Government colleges alone can command the advantages of bringing all classes of men, who are to be the leaders of the public thought, on an arena of common thought and mutual good will.

“In the Resolution of the Government of India it is said that by the withdrawal of Government from the direct management of colleges and schools ‘the native community will be able to secure that freedom and variety of education, which is an essential condition in any sound and complete educational system.’ Were the Indian people one, such policy would be certainly the most suitable for the promotion of education, but if we consider that it is composed of so many classes widely differing from each other by caste or creed, we may say that unity is impossible in such variety, and without such unity a sound and complete educational system seems impossible. It is not sufficient to foster the spirit of independence specially in the matter of education, it must be directed and controlled. The Government colleges alone can afford such control in the present state of India.

“It is then more necessary than ever for Government to retain all its institutions. If, at such a moment, the Government were to withdraw totally or even to a large extent from the direct management of colleges and schools it would certainly prove fatal not only to education but to Government itself.

“Since the question has been moved, the public opinion has been much offended. Such step is disapproved by the best educated native gentlemen. Such contemplated withdrawal is looked upon in every Indian quarter with distrust and disaffection.

"So the Catholic Bishops of Southern India, who are certainly in a position to judge of the pernicious effects which such a measure could possibly have on Government and education have not hesitated to warn the Government through the Education Commission against such a *fauzpas*."

(e) The Hon'ble Mr. Justice West of Bombay says:—

"It (Government) must endeavour to make itself felt through the whole scheme of the nation's development in such wise that this may be always advancing yet without abnormal growths and without estrangement from existing institutions. Of all men, therefore, those who govern in India will be the most short-sighted if they leave the great moving forces of the future to the impulse of mere chance. They must guide the movement through the education of the people and they must fit themselves to guide it aright on a secular basis."

(f) Dr. D. Duncan says in his evidence what is in complete accord with the Hindu view:—

"There is every reason to believe that what has generally happened in the past would usually happen again, on the closure or transfer of a Government institution of the higher order. The 'private bodies' would in nine cases out of ten be the agents of some one of the missionary societies. Now I cannot conceive that it was the intention of the framers of the Despatch of 1854, or that it is the desire of the Government of India, to see education practically taken out of the hands of the natives of the soil and monopolized by persons acting under instructions from committees in great Britain or elsewhere. If Government really desires to foster self-help among the people (and I entertain as little doubt about that as I do about its being the duty of Government to cultivate it), more care should be taken than is usually done to see that the closure or transfer of the State school has that effect. As a rule the worst measure that could be adopted to secure that end is to hand it over to one of the missionary bodies. A missionary school is to a certain extent a charity school. Now if it were proposed to rouse a community to private effort in the management of its own affairs, it would hardly conduce to that end if a foreign society were to establish a soup kitchen, or a work-house, where food or shelter could be obtained at only a fraction of its value. This would be to pauperize the people rather than to stimulate self-help. And nothing but the glamour of false sentiment prevents people from seeing that a system of education largely supported by foreign charity must have the same pauperizing tendency. On the other hand, there are as yet very few districts in which the transfer of a Government institution of the higher order to the management of the local committees of

native gentlemen would not act injuriously on education. The reasons for this will be found in my answer to Q. 36. With the spread of the higher education, every year will see it becoming more easy to make such a transfer with impunity." (p. 4.)

VIII. The missionaries assert that were the Government Colleges annihilated the standard of instruction would not deteriorate ; but this is not the opinion of those who know the country at least as well as the missionaries.

(a) The Revd. E. Sell, Secretary, C. M. S., Madras, says in his evidence in answer to question 38 as to the risk of a deterioration in the standard of instruction in the event of the withdrawal of Government from the direct management of schools or colleges :—

(a) "No, for the University fixes the standard, not the Government Colleges."

The Revd. W. Stevenson says, in answer to the same question :—

(b) "In the event of the Government withdrawing to a large extent from the direct management of schools or colleges I see no reason whatever to apprehend that the standard of instruction in any class of institutions would deteriorate. I do not see that at present Government institutions can claim the honor of maintaining the highest standard. It may be, that taking Government institutions as one class and all aided institutions as a second class, the former show better results at the University and other examinations than the latter. But such a mode of comparison is manifestly unfair. Government institutions may rightly enough be placed in one category, as they are all organized in the same way and are under the same management. But with aided institutions the case is very different. They are under all sorts of managing bodies and vary indefinitely in their equipment and efficiency. Some of them are but adventure schools of yesterday, while others are older than, as well as organized and manned and quite as efficient as any Government institutions. It is no just comparison therefore to throw them all into one class and set them over against the compact body of Government schools and thus find an easy demonstration of the superiority of direct Government to aided education. But let the best of the one class be compared with the best of the other and the aided institutions will, I submit, be quite equal to those of Government.

"Further if Government schools are transferred to local bodies I do not see why they should not continue as efficient as before. The University standards will not be lowered, the teaching staff is not likely to be smaller or less efficient and the Director and Inspectors will still remain to encourage and stimulate the managers."

The evidence of enlightened observers is however different. The following is the evidence of—

(a). The Hon'ble Mr. Justice West :—

"I conclude that the benevolence which sustains the Free General Assembly's Institution and St. Xavier's College is by no means wasted, but these institutions would not take the place of the Government colleges, if only because the people could not use them. If the absence of competition did not make them more distinctly propagandist, they would, at any rate, be suspected of it; this would keep many youths away, and in fact they would almost inevitably fall into a subordination of their secular teaching to the main ends of their being. The University could not keep their scholarship up to the mark when it had only their own professors to choose from for its examiners in the higher examinations."

(b). H. H. The Maharajah of Travancore (p. 7 of his "Letter to Mr. Grant Duff") writes :—

"It is further doubtful whether, when once entrusted to Missionary agencies, higher education will continue to retain its present high standard. The Missionary Schools that have actually come up to the standard of Government Colleges are very few; and when all wholesome rivalry is taken away there is no saying whether the few that have made a fair approach like the Madras Christian College under the guidance of that able and indefatigable Missionary Educationist, the Rev. W. Miller, will not fall back."

(c) Mr. Bickle, Government Inspector of Schools (p. 9 of his evidence) observes :—

"If the Government were to withdraw from the direct management and maintenance of the High Schools and Colleges which they now support, the result, in my opinion, would be their immediate collapse, as I do not believe that a sufficient number of people in affluent circumstances would be found to combine for their maintenance even with a fair share of State aid."

(d) The Revd. T. L. Gallo, S. J., (p. 6 of his evidence) writes :—

"The withdrawal of Government to a large extent from the direct management of schools and colleges relying upon

local exertions would have, in my opinion, a very sad effect on the spread of education, for native gentlemen would not be found so devoted to the cause of education. On one hand such gentlemen obtain at present all educational advantages without much trouble or expense to themselves; and on the other, the elements of public spirit and independence, which alone could make them desirous of relieving Government of this trouble and expense, are certainly not as yet sufficiently developed in this country to allow us to suppose, if Government withdrew from a direct share in the work of education, the balance, which its action now maintains among the other agencies, would not be destroyed. The most powerful agency would gradually obtain the monopoly of education, which might then be easily diverted from its true end, and converted into a means of extending some private influence, fostering propagandism, &c. Moreover, skill in management, power of organization, long experience, a thorough acquaintance with Western knowledge and Western systems of education, are absolutely essential. There is no doubt that natives are comparatively deficient in these qualities. Should any one object to this that European masters might redeem this inferiority, I would reply, first of all, that native managers would naturally prefer to fill their chairs with native men who would be satisfied with far smaller salaries than Europeans would require, and secondly that it would not be easy to find out European professors to accept office under native control. One might here say that European teachers belonging to European, though private establishments, would perhaps accept the inheritance of Government. The answer obvious to this is that as only Protestant Missionary Societies might be able to do so, there would be great reasons to fear that education would at least run a serious risk of becoming a monopoly in the hands of a class, and thereby the present object of Government education would be easily perverted and changed into engines of propagandism. Add to this that Catholic parents cannot allow their children to receive instruction in schools conducted by Protestant societies where instruction in the various Protestant creeds is given *ex professa*, often made compulsory, and in all cases pervading the whole teaching.

“I cannot in any way doubt that, in the event of the Government withdrawing to a large extent from the direct management of schools and colleges, the standard of instruction would deteriorate, nor could I suggest any measures in order to prevent this result but that which I suggested in the answer to the question 36.”

The suggestion made is as follows:—

‘The parts that should be taken by Government in a com-

plete scheme of education for India, in my opinion is that Government continue to have a direct share in the work of education, so that Government institutions be allowed to continue as the base of the educational system, give the impulse they have hitherto initiated and directed, and maintain the balance which its action now maintains among the other agencies. As to other agencies, three things are necessary. The first is full liberty to have their own institutions. The second is an impartial distribution of all the assistance in the power of the State. Thirdly, the right to Government of inspecting and controlling their work. I cannot bring myself to believe that any other arrangement might, for the present and very likely, for long henceforth, prove useful to the education in India."

(e) On the same point Mr. Justice Muttusami Iyer in his evidence says:—

(e). "The standard of instruction will certainly deteriorate especially in colleges. The only measure I could suggest to prevent this result is that certain schools and colleges be kept up by the State as model institutions."

Mr. Krishnama Chariar says, in answer to Question 16:—

"To hand over the few Government institutions to these (Missionary) Societies would, I believe, be, to put it on no higher ground, a grave political blunder. It would lead to deterioration of the quality or a lowering of the standard of high education, and merely hinder the further progress of all education whatever."

Again, he adds at the close of his evidence:—

"The retention, and even the further development, of a few State Secular Colleges as models for the imitation of aided native institutions, as to how the Literature and Science of the West should be taught to Hindu students is, in my opinion, a *vincit quæ non*." * * * I am quite sure that if one particle of the efficient support and direct control now extended to the High Education in State Colleges by the Government were withdrawn, not only would the work of Higher Education itself suffer most materially by being scamped and neglected, but the education of the masses would become hopeless."

IX. Christianity, as Christianity, has done nothing more than Hinduism, Buddhism, and Mahomedanism for Education in India, and scepticism is the result of the teaching not of Government, but of Mission Schools.

This is clearly shown in the following extract from a letter which appeared in the *Madras Hindu* of the 7th December 1882, under the signature of a *Hindu Educationist* :—

“What I have principally to do in this letter is to show the baselessness of this *Christian Educationist's* assertion, that scepticism is the fruit of neutral education. But before I proceed to do this, it will be well to let a little daylight in upon one other of his many wonderful propositions. He says in one part of his letter, “our educated friend would never have been an educated man at all, or have troubled his head in the least about morality and truth, if it had not been that God had given to the most Christian country in the world this grand but heathen empire, to christianize and teach the beauty and force of truth and morality! What has Hinduism, what has Mahom-madenism, and what has Buddhism done for his ancestors in this country?” This, no doubt, is all very triumphant, but what are the facts? India happened to come under the rule of a Christian nation. To administer the government of the country, it was found necessary to throw open all kinds of judicial and executive posts to natives of the country, and to qualify themselves for these Government appointments natives eagerly took advantage, and still do so, of the facilities afforded to them in all classes of schools throughout the country of obtaining the requisite English education. The ambition to obtain a Government appointment, and the fact that this ambition can be gratified only by possessing a good English education, give the true explanation of the success of the several classes of educational institutions in India. Were the Government of India to fulminate an order to-morrow closing these appointments to the natives of the country, every English school from the Himalayas to Cape Comorin might at the same time shut its doors. Education, either for its own sake alone, or for the sake of the concomitant morality that is supposed to go along with it in Mission schools, is not sought for yet by the people of India. Such a state of things may come into existence in the distant future, but it is ridiculous to represent it as having already come, when everyone, except perhaps a perversely blind *Christian Educationist*, knows the contrary. Christianity, then, has done no more than Hinduism for education in India in the sense in which the *Mull's* correspondent claims that it has done, though a Christian Government has lent a stimulus to it by throwing open the appointments under it to educated men.

“I now come to the question of scepticism. A *Christian Educationist's* position is, “that our so-called neutral education

destroys all religion ; and therefore it is idle to talk of morality ; and that the undisputed existence of scepticism is traceable to this cause." The "undisputed existence of scepticism" may be granted to the *Mail's* correspondent, but what the cause of that scepticism is, is quite another question.

"In Mission Institutions the Bible is taught for one hour daily, and in Mission Institutions the fees are considerably lower than in Government Schools. The latter circumstance accounts for the presence of Hindu youths in mission schools, and the former, as a rule, produces one of two very different results, either greater indifference than before, and even hostility, to Christianity, or an unbelief in all religion whatever. Some students who attend the Mission Schools, regard the hour devoted to the reading of the Bible as, though a gratuitous waste of time, a necessary evil to be submitted to in consideration of the saving effected in the matter of school fees. In this frame of mind the Hindu students attend the Bible lesson—present in the body, but absent in the spirit ; and the recollection of the 200 hours or so annually, which, in their opinion, are thus lost from more useful studies, does not certainly increase their love, or lessen their indifference, but rather increases the latter, and, in some minds excites an active antagonism to, Christianity. This, missionaries will confess, is not a very desirable result, but it is preferable to what happens in a great many other cases. For, of two contradictories, Christianity and Hinduism, both cannot be true. Accordingly, the other students referred to, find their faith in the beliefs of their fathers unsettled, for to do this is the scope of mission teaching, but they are not prepared to accept the new religion, and they do not accept it, and this of course, leads surely to scepticism, if not to something worse. In Government Schools such a result is impossible. The great moral truths which are common to all religions, and references to which continually recur in the English writers studied, can, in these institutions, be dealt with, and are so dealt with, without raising the suspicion that their enforcement is intended to support one particular form of religion, and to undermine another. A *Christian Educationist* would therefore, so far as the knowledge of every unbiased Hindu goes, be nearer the truth in ascribing "the undisputed existence of scepticism" to the tactics pursued in mission schools, than to the education imparted in Government institutions, where practical morality is inculcated, and where no attempts are made to sap the foundations of all belief.

"What are the Mission schools doing for Christianity? Nothing is more dreaded in a Mission school, and by a Mission

schoolmaster, than a conversion. The Missionaries know that a conversion means the emptying of their schools. A few weeks ago a student in a Mission School wished to be baptized. One of the heads of the Mission was eager that the baptism should take place, but the head of the school, it seems, would have nothing to say to it—on what grounds history does not say. What is the use then of dinning into people's ears what they know to be false? If neutral education produces scepticism, what, in the name of reason, is Mission education doing? Does it produce Christians? No. We have no census returns of the number of sceptics, or atheists, or formalists, or hypocrites, produced by one class of institutions or another, but those who know anything of the country, and of the results of educational efforts in the country, know that scepticism is the out-come, not of Government, but of Mission, schools.

"Missionaries know that conversions at the present time are not only impolitic but next to impossible, except those popularly known as "rice" conversions. They seem therefore, to think that they may do evil that good may come, and that they may unsettle young men's belief in their faith alleged to be false, in the hope, that in time, they will become Christians. But if these young men do not become Christians, and cease to believe in Hinduism what are they? Sceptics, atheists or whatever name the *Mail's* correspondent prefers; and this class, it is lamentable to think, forms a very large part of the educational out-turn of Mission Schools in India."

X. High Education in India cannot be transferred to Christian Missionary Colleges, if the Government at all care for the feelings and wants of their Native subjects. The following is what Mr. Lethbridge says in chapter VIII of his work on "High Education," and we quote his views *in extenso* as clearly showing the real meaning and motive of the Missionary party in desiring such a transfer, and the serious evils of such a measure:—

"As Christians and as Englishmen we should never forget that the cause of Christian Missions in India has to face a difficulty far greater and more delicate than any that can possibly meet us elsewhere; the difficulty, namely, that by honor, by justice, by every religious sanction, we are forbidden the slightest use of our power as rulers in aid of proselytising efforts. When we forget this—as the "General Council on Education" seems to have forgotten it—we not only commit an unspeakable political blunder, but further than this, we bring the religion

that we would recommend into contempt and hatred. Moreover, such a controversy as that which has been stirred up by the "General Council" makes the position of conscientious Christians in the Indian services particularly disagreeable and invidious. The stern dictates of their highest duty compel them to denounce a movement they would gladly see advanced by other and more straightforward means; and they are thus forced into apparent antagonism to a cause that would be very near their hearts, if it were fairly and honestly advocated. In every way the action of the "General Council on Education" is to be deplored, for the best interests of the people of India, for the sake of the Christian religion and the good name of the English nation, for the credit of our Indian administration. I would fain see the Council alter the line of its advance. The extension of mass education, and the enlargement of the sphere of usefulness of the Missionary Colleges are both excellent objects to be kept in view, if they can be attained fairly and without injury to the State Colleges. Let the "General Council" open subscriptions for these purposes, and the funds so raised will do great good in India both from the immediate results and from the feelings of appreciation and gratitude that will be evoked among the Indian peoples by such a display of disinterested zeal and benevolence. Or let the Council endow some private colleges, so as to enable the latter to compete with the Missionary Colleges on equal terms when the State Colleges are closed. But for any useful action of this kind it is absolutely necessary, first of all, to show clearly that there is not involved in the movement any of that hungering after "hunks of the tempting cake of the education grant" of which the *Hindu Patriot* speaks so bitterly.

"With regard to the suspicion regarding the desire of Christian Missionaries to get the highest education of the country entirely into their own hands, all that need be said is that, whilst the desire is perfectly legitimate and, indeed, praiseworthy on the side of the missionaries, we cannot wonder if orthodox Hindus and Mahommedans do not view the proposal with approval; on the contrary, it is quite reasonable that any disposition on the part of the Government to encourage these proselytising aspirations should be keenly resented by the native community. It is of course obvious that the withdrawal of the Government from the State Colleges will at once enormously increase the power and importance of the Missionary Colleges—and this in several ways. In the first place, the rich endowments which they derive from the home mission funds will make their professors masters of the situation in the competition with "private enterprise." And in the second place, inasmuch as these funds will enable

the Missionary Colleges to offer a better, or at any rate a cheaper, education than that obtainable in the private colleges, the former will be enabled to take up a very different attitude on the question of religious teaching from that hitherto held by them. At present, in the many famous Missionary Colleges of India, the teaching is most efficient in the highest branches of mathematics, of philosophy, of natural science, of the whole "profane" learning of the Universities; but in the matter of religion, General Tremeneere has shown that a little perfunctory Bible reading for perhaps an hour or less each day is all that is ventured on—and it has been stated that the proved conversion of one of the students would probably have the effect of emptying the college to which he belonged. If the parents of the students thought there was any serious risk of their sons becoming Christians they would prefer to pay the Rs. 12 fee of the Government Presidency College rather than incur that risk for the privilege of only paying Rs. 5 per mensem. But in the case we are supposing there would be no Presidency College for them to turn to. The Missionary Colleges would be able to offer their students such an education as would usually place them at the head of the University class-list at an "eleemosynary" rate of payment; and might fairly claim in return the privilege of teaching them freely the doctrines of Christian religion. It is, I admit, difficult for Christian men to recognize in this contingency an unmixed evil. I have felt this difficulty. But every sentiment of fairness and justice must force us entirely to sympathize with and respect the feelings of our Hindu and Mussulman fellow-subjects in demanding from our common Government the most absolute neutrality in religious matters; and as a matter of expediency, as well as of equity, hardly any graver objection could be offered to a Government educational policy than that its natural result would be largely to throw the highest education of the Government into the hands of a propaganda, however laudable the aims of that propaganda might be."

XI. The opponents of State education are merely throwing dust into the eyes of the public in England and in India by entering into various calculations regarding the expenditure on different classes of schools, and leading them to suppose that their figures, which they persistently reprint, are to be relied on, and on this assumption characterizing the action of the educational authorities, in South India especially, as unfair to aided schools in general, and to the

Madras Christian College in particular. But the fact is that the total amount expended on education of all kinds within the Madras Presidency is really considerably less than that given in the Madras Administration Report; but even were the expenditure much greater, Government has pledged itself not to close any of its schools against the expressed wishes of the people to leave the ground clear for the missionaries, and not to desist from doing what is essential to maintain the principle of absolute religious neutrality in employing the people's money for educational purposes.

The *Madras Mail* of the 27th February 1882 contains a well written article entitled "Instructions to the Indian Educational Commission," which, it is an open secret, was written by the ablest and most popular educationist whom Southern India has even seen. The following extract from the article referred to will sufficiently prove the first part of our proposition :—

"The Resolution (constituting the Viceregal Commission) concludes by instructing the Commission to revise the statistical returns of education with the view of placing them upon an intelligible, and uniform basis. This is very desirable. At present it is difficult even for experts to make out the true state of the facts. We had recently occasion to comment on the blunder of adding to the entire cost of Government schools, the refund of the fees, and calling the sum the amount spent on education. But since the date of our remarks, we have observed that the Director's figures have been adopted in the Madras Administration Report, and in the official summary recently reprinted in our own columns. The figure of thirty-one lakhs given as the total sum expended on education from all sources in this Presidency, is swelled by a sum of nearly two lakhs, which is really a refund, and not an additional sum spent on education. The repetition of the blunder requires a repetition of our comment. And, as before, to make the matter clear, we will venture on an illustration. At the Madras Railway station, a person pays Rs. 40 for two railway tickets, one for himself the other for his friend, who is looking after the luggage. As soon as they are quietly settled in their carriage, the friend refunds Rs. 20. Now the Director adds these sums, and says that the tickets cost Rs. 60. There must be some excuse, the reader will say, for perversity of this kind. There is an excuse, and it is this. There was once a time when a part only of the cost of Government schools was paid out of the treasury at the beginning of every month, the remainder

being paid out of the fees which were not then credited to the Government, but remained at the disposal of the Director. The total cost was then rightly found by adding the fees to the Government payment, and this system has been continued when the circumstances are entirely changed. One is inclined to exclaim, with how little thought the finances of the Department seem to be managed !”

In support of the latter part of our proposition, we would urge, in addition to what has been already advanced, that those who so violently advocate the abolition of Government schools and Colleges rest their case on the Despatch of 1854. Even this, as Mr. Lethbridge shows, admits of a different interpretation, but there is much stronger, because direct, evidence of the real intent of the Home authorities. In 1857 the Court of Directors in their letter No. 35, dated February 18th, wrote as follows :—“ We attach the greatest importance to the system of grants-in-aid *as an auxiliary to the direct measures of our Government* in India, for the extension and improvement of general education.” The direct measures were thus to be the backbone of education, and the system of grants-in-aid merely an auxiliary—a very important auxiliary, but still an auxiliary. The Missionaries however say “ No : there must be *no* direct Government education :” so that the offspring is to devour its parent.

Again, they would ignore the universal outcry of the Hindu Community against Government severing its direct connection with education : but what says the Secretary of State ? He shall speak for himself in his Despatch No. 6, dated 14th May 1862, as follows :—

“ It was stated in the Despatch of the Court of Directors of 19th July 1854, that no 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 ; and it was contemplated that a time might come when many existing Government schools might be discontinued, and the work of education, to a greater extent, carried on by private institutions aided by the State.”

"In the application, however, of this latter principle, attention must necessarily be given to local circumstances, and you have learnt from subsequent despatches that *Her Majesty's Government* are unwilling that a Government school should be given up in any place where the inhabitants show a marked desire that it should be maintained."

On this explicit declaration, the Hindu community may well take its stand. And in so expressing himself, the Secretary of State did but reiterate the intention of the Court of Directors, stated with the same explicitness in their letter to the Government of India, No. 50, dated the 1st April 1857, in the following words.—

"It is alleged that the people of Behar are not likely to accept English instruction except at a Government institution, and . . . we desire that the subject be reconsidered with the view of constituting the school at Dinapore a Government school" (instead of an aided one.)

The Government had a few months earlier in Despatch No. 96 of October 1st. 1856 written—"We approve of the English school at Gowalpara, which had been established and previously maintained by private subscription, having been constituted a Government school."

These declarations distinctly lay down the following principles :—

First.—That there is to be "no abolition or transfer of a Government institution in any place where the inhabitants show a marked desire that it should be maintained."

Second.—That, where circumstances render it desirable, a private school may be constituted a Government one ; just as, in other circumstances, a Government school may be made an aided one.

XII. It is maintained by those who advocate the withdrawal of Government from direct interference

with higher education in India, that a large sum would in this way be "set free" for the spread of primary education among the masses,—but this, like all the other missionary propositions, is not true in fact.

We have already shown the want of frankness on the part of the Missionaries in urging the withdrawal of Government from direct connexion with the higher department of education to secure the so-called extension of lower education; but we cannot understand the want of prudence and statesmanship in our rulers in yielding to this pressure from without; nor on financial grounds can we understand their going out of their way to invite the landed gentry and other private agencies to relieve the State, not only of the cost of higher education, but also of the expense of primary education [*vide* the Viceroy's Speech at the last Convocation of the Calcutta University]. It is hard to realize such a strange want of perception of the needs of the country as regards a complete scheme of National Education. The work to be done is one of vital importance to us as a nation, and it should be controlled and paid for by the State, rather than by wealthy landlords and nobles in the country, who are too often liberal against their will, or by the chance donations of pious people in foreign lands, obtained by the missionaries, who are ever ready to beg on the plea of promoting the development of Christianity in India; while everyone here knows the utter failure of Missionary efforts to gain Native youths over to the cause of Christ; and besides the Government should not stoop to seek eleemosynary assistance of this kind, if one of the greatest of its duties is to systematically educate the people. This is peculiarly the case when the government of the country is carried on by foreigners who have great difficulty in ascertaining the indigenuous public opinion indicat-

ing national requirements. We would ask our rulers and the religious bodies that persistently agitate and instigate them to change the present educational policy of India, whether, if the education of the people at large in England had waited until their obligation to start and maintain their own schools had been universally accepted, the intellectual advancement in that country would be so marked as it is at present? We challenge the opponents of the present educational plans in India to answer this simple question. Here we will quote the following from an article in the *Madras Mail* of the 27th February 1882 as containing a satisfactory exposition of the views which we know to have commanded the entire sympathy of the intelligent classes of Southern India at the time the article was published—just when the Education Commission was entering on its labours:—

“The burden of the Resolution is primary education. To help those who cannot help themselves, must be the great aim of State aid. Not that Government have any wish to check or hinder higher education; all they desire is to see the two advance with equal step. If this is all, Madras seems already to have attained the desired result. If we may trust Mr. Grigg's figures, the annual expenditure on elementary education has grown by nine lakhs and a half since 1871, while that on higher and secondary, has increased by less than one lakh, and the total annual account of the former expenditure is now nearly double the latter. With reference therefore to absolute cost, primary education, in this Presidency at least, has already passed its competitor in the race, and is every year leaving it further behind. This activity on behalf of primary education is, it must be confessed, recent, and being recent, the entire results under the Despatch of 1854, are much less in that portion of the field than in higher education. And the Government, reviewing the whole period of a quarter of a century, are more impressed with the smallness of the total results, than with the activity of the last decade. In their zeal to rectify this inequality, and not giving due weight to the rapidity with which, as we have seen, it is rapidly rectifying itself, the Government have proposed schemes for the consideration of the Commission, which seem to us for the present to be premature, or which at the least will require very careful consideration, lest in trying to help for-

ward lower education they endanger much that has already been done for the higher.

“One part of the Government scheme is to hand over their own colleges and schools to bodies of native gentlemen, who will undertake to manage them as aided institutions. Not indeed necessarily all at once, so that on a preconcerted day, Government shall wash their hands of all direct connection with education. But all their own institutions are understood to be in the market with the Director as a kind of permanent auctioneer, and the Government declare their willingness to knock them down one after another, whenever a satisfactory bidder comes forward. This is one of the points on which the policy is settled. The Commission is asked merely to assist in the details of the transfer. The natural way of considering a novel scheme of this kind, is first to enquire what is proposed to be gained by it. This is clearly stated by the Government. The object is to *set free* funds now employed on higher and secondary education, with the view of devoting the money thus gained to primary education. But no estimate is given of the amount they hope to gain in this way. We shall endeavour to supply this omission with regard to our own Presidency.

“Every one knows, that for some years past, the annual sum spent on education by the Madras Government out of provincial funds has been between nine and ten lakhs, and if this were the sum to be operated on by the proposed scheme, it would be well worthwhile to run some risk for the sake of the large saving that might be looked for. It will be found, however, on examination, that three-fourths of this sum will be untouched by the proposed abandonment by Government of their schools and colleges, leaving only the remaining one-fourth on which any saving can be made. Out of the sum of between nine and ten lakhs, are paid, first, the expenses of direction and inspection which will still be needed for elementary education and aided education of every kind, and next, the grants-in-aid to private colleges and schools. These two items take in round numbers one-half of the whole. The other half, which is the cost of Government schools and colleges, must be still further reduced before we find the sum we are in search of. For, it includes the cost of normal schools, which must still be kept up by Government, to provide trained masters for aided schools, and the cost of sundry technical schools, such as the Schools of Arts, Agriculture, and Medicine which it is not proposed to drop. Making these reductions, and subtracting also the small amount paid for primary education out of provincial funds, we at last reach the sum of which we have been in quest—that is, the cost of the schools and colleges for higher and secondary education which belong to Government, and which they declare themselves ready to abandon to the

highest bidder. That sum is a little under two lakhs and-a-half. This is the entire cost omitting endowments of the schools and colleges just mentioned. But the cost to Government is much less, for there is a refund in the shape of fees to the amount of nearly a lakh and a quarter, leaving the cost to Government about a lakh and a quarter, which would be the amount of saving, if these schools were entirely abandoned. But as the Government propose that they shall be carried on as aided institutions, they will still cost Government the amount of the grant-in-aid. Taking the same proportion of total cost as at present paid to aided institutions of the same class, this contribution will amount to Rs. 70,000. In other words, there will be as the result of this momentous change, a final saving of about half a lakh.

“As the foregoing figures may have been tedious to follow, we shall give a summary of the results in a single sentence. The schools and colleges for higher and secondary education, which the Government are now proposing to abandon, are at present carried on, taking account of the amount refunded in fees, at an annual cost to Government of about a lakh and a quarter. When changed to aided schools, they will still cost the Government Rs. 70,000, leaving a saving of a little more than half a lakh. It is not a great result, and will have no appreciable effect on the education of the masses. Meanwhile, the change will be attended with a certain risk, which it might be worthwhile to run for a large saving, but scarcely for a dribble like this. Bodies of native gentlemen ready to give the necessary time and trouble, and willing and able to find the funds required over and above the fees and the grant-in-aid, are not to be had in every town, where there is a Government school. It is true that the Government hope that Municipal bodies will come prominently forward to undertake the management. But most of these are already over-burdened by the duties and expenses which Government have thrown upon them. Besides, it would be unreasonable to charge on a single town, or district, the cost of an institution, which in fact benefits a very much larger area. This remark applies particularly to the case of colleges. Why should the town of Madras bear the expense of the Presidency College which draws its students from every part of the Presidency? Municipal bodies are more-over ill-suited for the management of such an institution. The work is wholly beyond their sphere. To take a single point, they are not in a position to offer such a guarantee as would induce a European Professor to take service under them. But it is unnecessary to argue the question further. It is obvious that in the present stage of native society, neither Municipal bodies, nor groups of independent native gentlemen, offer any hopeful machinery for carrying on the work of the

higher education, however well adapted they may be for taking charge of elementary education. The Government suggest no other alternative, but one will immediately suggest itself to every one acquainted with the currents of thought in this Presidency. It is well known that the Missionary bodies in Southern India, have long regarded themselves as the heirs of Government in the matter of higher education. They have often urged Government to retire, and leave the ground clear for themselves. Their opportunity has now come. In the auction which the Government propose, the groups of native gentlemen will not bid. They cannot organize themselves in time. The Municipalities too, will make default. But the Missionary bodies will be eager and forward, and in the end will be left in nearly sole charge of the higher education of the country. Whether this is an agency which offers a reasonable prospect of stability, or whether it is otherwise in every respect desirable; is a question which is well deserving of the attention of the Government and of the community."

In conclusion, we solemnly call upon H. M.'s Government and the Government of India to pause before they adopt, merely to minister to the gratification of the vanity of a body of irresponsible and more or less fanatical agitators, who, no doubt, fancy they are animated by a pure philanthropy, an educational policy which is not only retrograde, but which is calculated to overthrow, not Hinduism, if such be really their desire, but all the superstructure of beneficent results which has been reared on the basis of the enlightened educational policy of the last forty years. Although the Missionary bodies deny that they would accept the charge of Government educational institutions, if Government should retire from direct connexion with education, yet they know well that, were Government schools to be closed to-morrow, there would be practically no educational agencies in the field except themselves. There cannot be two opinions upon this point, and no men of common sense in India would venture to dispute it. Let the Government find out, through proper native channels, what the real wishes and opinions of the people are on this momentous

question, before they allow themselves on a false issue—the necessity for the spread of primary education, about which opinion is divided*—to be made parties to the perpetration of a vast iniquity. Let them not readily acquiesce in the wild recommendations of over zealous missionaries, and begin to treat the people of India, as slaves who are to have no voice either as to the manner in which, or the agency by which, their children shall be educated, though they have to defray the entire cost of their education. Let them listen to the voice of impartial Anglo-Indian officers who, like the late Political Commissioner, General G. LeGrand Jacob, claim “to know the hidden dangers of Indian political navigation, by intimate acquaintance with the feelings and opinions of its people,” having been thrown much amongst all classes of natives and speaking their language as their own. Let them, in short, honestly carry out the Queen’s Proclamation which is looked on by the natives as the Magna Charta of their rights, civil and religious. “Firmly relying ourselves on the truths of Christianity, acknowledging with gratitude the solace of religion, we disclaim alike the right and desire to impose our convictions on any of our subjects. We declare it to be our Royal will and pleasure that none be in any wise favoured, none molested or desquiated, by reason of their religious faith or observances, but that all shall alike enjoy the equal impartial protection of the law; and we do strictly charge and enjoin all those who may be in authority under us, that they abstain from all interference with the religious belief or worship of any of our subjects, on pain of our highest displeasure.” So runs Her Majesty’s Proclamation of 1858, and who will venture to violate the

* See Evidence of the Bishop of Lahore, and of Mr. Nesfield, Inspector of Schools, Oudh, and also the utterances of the *Hindoo Patriot*, October 1851, and of the *Asiatic Researches* of 2nd December 1852.

pledges therein solemnly given? Yet to induce the Government of India to violate these solemn pledges is the real object of the missionaries and the "Council." In his reply to H. H. the Maharajah of Travancore, Mr. Johnston writes, "The movement originated with men of *pronounced Christian convictions, who desire that all men may share with them in the blessings of the Christian faith*" (Reply, p. 21). In other words, conversion to Christianity is the object of the movement.

It is true that His Excellency Mr. Grant Duff in paragraph 62 of his able review of the events of the past year says that "we may await with the most perfect composure," the report of the Commission, "which is likely to do justice to all parties." We have full trust in the good faith of these words, and also in the good faith of that honest and steadfast friend of the country, Lord Ripon, in appointing the Commission. But neither Lord Ripon nor Mr. Grant Duff knows so well as those who have watched the missionary tactics in India for many years the unscrupulous manner in which, and the questionable means whereby, missionary aims and objects have been effected in India. We do not say that all the Indian Missionaries act thus unfairly, and we certainly have no reason to question the character of the operations of Roman Catholic Missions in this part of India—but we do say that the zeal of a certain proselytising clique of influential Protestant Missionaries has so outrun all discreet bounds that, to a neutral spectator, their actions do appear to be more clever than scrupulous. We do not doubt, we repeat, Mr. Grant Duff's good faith, and we loyally appreciate his honest endeavours to allay the fears of the people of Southern India about higher education—a fear which he confesses to be "a really genuine one." But what we say is, that neither the

Viceroy nor our Governor knows the length to which the missionaries are prepared to go to gain their ends. Mr. Grant Duff, for instance, does not seem to be aware, when he describes Mr. William Miller as a representative of South Indian ideas on educational subjects, that a missionary partisan more one-sided and biased does not breathe than Mr. William Miller. A zealous friend to missionary education he no doubt is ; but he sits in the Commission pledged (Secret Pamphlet, p. 5) to the abolition of State Colleges, he being the foremost of the signatories to a set of answers to the queries, secretly sent out about this time last year by the Reverend James Johnston of London,—signatories who firmly “believe that an honest adherence to the policy of abolition or transference of Government institutions, especially those of the higher class is the one chief measure required to put education in this Presidency on a sound footing,” all the time forgetting that the Government Colleges and Schools are nothing less than an organic part of a national system of education in India while the Missionary schools can be nothing more than of temporary value. Mr. Miller, furthermore being the soul of the *Missionary Education Committee* in Madras, has not been, and can never be, accepted as the exponent of Hindu views on education, though he may vainly fancy himself so, and profess to plead the cause of native *aided* schools merely with an eye to serve the interests of *aided* Christian education thereby. Thus Mr. William Miller, instead of being a representative of South Indian ideas, is known to be at heart opposed to the cherished beliefs of the people. Mr. William Miller is not the only one in the Commission who is similarly minded. In these circumstances, it would be a want of moral courage in the educated community of India not to raise its voice, especially when the Viceroy and the Council are anxious to listen to the voice of the

people, and warn the Government against accepting any recommendation which would tend to strengthen the hands of those who wish to grind the natives of this country down under an ecclesiastical tyranny.

But, Hindus, equally with the "Council" advocate the carrying out of the Policy laid down by the Home Government—the *whole policy*, let it be noted, and not a part of it. That whole policy cannot be more tersely put than it was by the Secretary of State, in his Despatch to the Government of India, No. 12, of December 24th, 1863, in the following words:—

"Her Majesty's Government have no intention of sanctioning a departure from the principles deliberately laid down, and, while they desire that the means of obtaining an education calculated to fit them for their higher position and responsibilities should be afforded to the upper classes of society in India, they deem it equally incumbent on the Government to take, at the same time, all suitable means for extending the benefits of education to those classes of the community 'who,' as observed in the Despatch of July 1854, 'are utterly incapable of obtaining any education worthy of the name by their own unaided efforts.'"

We would therefore once more repeat that Her Majesty's Government and the Government of India, as well as the Viceregal Commission, must not close their eyes to the real meaning and motive of the missionaries and the "Council" in the mischievous agitation which they have originated and are carrying through with the support of some distinguished statesmen who, though animated by worthy motives, have not had the time to inquire into its true objects. Forty years ago the practice of bazaar-preaching was the only method approved by the missionaries for promoting their views. "When

Dr. Duff, after a short experience found that such a method was fruitless, because the ignorance and superstition of the people prevented them from realizing the grandeur of the message, he sought to overcome this obstacle by education. He established schools and gave the pupils a sound secular and religious education, like that which he himself had received at the Parish School in Scotland. At first he met with much opposition. The system was denounced as secular, unchristian, inconsistent with the practice of the early Apostles who went about all the country establishing not schools, but churches.* Influenced by this last consideration, the missionaries did not seek the Government grants in these unsophisticated days, and this more especially because a good deal of the money came from Pagoda funds and was therefore clearly the same as "meat offered unto idols." But by and by, as the grant-in-aid system came into active operation, the grant money, like the money produced by Vespasian's famous tax, was found to smell no worse than other money, their scruples were soothed, and their cry, like that of the daughters of the horse-leech, became "Give, Give." The more they got, the more they wished to get. At last they got so much that Government was compelled to curtail the grants. Then we had the first howl of this agitation, which was to the effect that missionary colleges were being dealt with unfairly by the Educational Department in India as to grants, and that this was nothing less than an attempt on the part of the Department to stamp out all private institutions, meaning their own; but when it was clearly and triumphantly shown† that such a charge

* "Christian Colleges as a Missionary Agency" by the Revd. W. A. Lebon, Senior Chaplain, Church of Scotland, Madras.

† See the Government Order embodying the correspondence between the Missionaries and Colonel B. M. Macdonald, lately Director of Public Instruction in Madras.

would not hold water, but was ludicrously and gratuitously false—then, “the signal given, behold a wonder!” another complete change of front takes place! Ingeniously enough the shriek now became—the ignorance of the masses, the necessity for the spread of primary education, and all the other bunkum of a similar character with which we have been nauseated for a year or more. “Set free,” say these philanthropists, “the money now spent by Government on the Higher Education, and devote it to the spread of education among the masses. No harm will come thereby to the Higher Education. No sooner shall the fiat go forth for the annihilation of the Government Colleges than native institutions will spring up in numbers, which, along with the Christian Colleges, both receiving liberal grants from Government, will fully meet all the demands of Higher Education.” We have already shown the utterly foundationless character of the assertion as to the springing up of native institutions, and that the withdrawal of Government would simply give a monopoly of the Higher Education to the missionaries; and that it is this monopoly, and this alone, which they desire, their desingenuous manœuvring and change of front abundantly prove. Somewhat after the manner of Proteus—continually changing—they just now show a new born zeal for the development of Native institutions, which they used to look on with an unfriendly eye, and even oppose and undermine; but they really do not care two pins for the education of the masses, or for schools of native growth. What they really want is the abolition of State colleges and the affiliation of feeble native institutions to their own, and the diversion thereby of all educational grants into their own hands, ostensibly for educational purposes, but really for pushing forward missionary enterprise

and for proselytising India. If Government and the lay section of the Education Commission keep this fact steadily before them, and resolutely adhere to the spirit of the Queen's Proclamation and Her Majesty's solemn assurances as regards any political intermeddling with the civil and religious rights of the people, we have full confidence that they will not lend themselves to carrying out a scheme which would surpass in enormity anything that has yet been recorded in the history of the world.

GOD DEFEND THE RIGHT.