CHAPTER IX.

PROFESSIONAL COLLEGES AND SCHOOLS.

I.—Introductory.

325. The present chapter deals with law, medicine, engineering, agriculture and allied subjects. Not all the institutions concerned are administered by the departments of education. Law and engineering colleges and schools are nominally under the local directors or universities, but their administration is largely influenced by the educational policy of the High Courts and the Public Works Departments. Certain legal examinations are, for example, controlled absolutely by the High Courts, while the universities control others. Medical institutions are under the supervision of the medical departments. Agriculture and forestry are not administered by the Department of Education and the final authority on these subjects in India is the Department of Revenue and Agriculture. Veterinary work is also dealt with in the same department.

II.—Law.

326. There are various grades of legal practitioners in India. Advocates Legal practitioners or vakils of a High Court practise before that court (but the latter do not, save at Madras and Allahabad, practise on its original side). Pleaders and their qualifications or mukhtars practise in the subordinate courts, save in the Punjab, Burma and Central Provinces where first grade pleaders are allowed to practise in the Chief Court of the province. Admission to the rolls and the qualifications for admission are decided by the chartered High Courts of Calcutta, Madras, Bombay and Allahabad, and also (subject to the Local Government's approval of the rules framed under the Legal Practitioners Act) by the non-chartered Chief Courts of the Punjab and Burma. The High and Chief Courts are also empowered to make rules (subject to previous sanction of the Local Government in the case of Chief Courts) for the qualifications, admission and certificates of persons deemed proper to be enrolled as pleaders of subordinate courts. The usual qualifications recognised are (i) a call to the bar of England or Ireland or enrolment as an advocate of the principal courts of Scotland; (ii) the passing of an Indian university degree in law—the B.L. or LL.B., the M.L. or LL.M., the D.L. or LL.D.; (iii) the passing of the pleadership examination prescribed and conducted by the court itself; (iv) the passing of a minor examination, such as that for mukhtars, generally held by the court. The qualifications carry different privileges under different courts. Calcutta admits, as advocates only barristers of England or Ireland and advocates of Scotland, and now likewise insists on a year's practice in chambers in England (unless the candidate is a member of the faculty of advocates in Scotland), and either three years' education in addition to this in the United Kingdom or a degree of a university either of the United Kingdom or of India. Other courts recognise the same but have not adopted the added conditions—save that the Bombay High Court requires a year's practice in chambers; but they also recognise Indian qualifications. Madras admits masters of laws of the Madras University after a period of further study; Bombay admits bachelors of laws of the University of Bombay after attendance and a further examination; Allahabad admits LL.D.'s of the University of Allahabad; the Punjab admits pleaders of the first grade who have practised for ten years (five of these in the Chief Court) or for three years in the Chief Court after obtaining the degree of doctor of laws of the Punjab University. Bombay and Allahabad also admit High Court or first grade pleaders after ten years' practice and under certain conditions. Madras and Burma admit advocates of other High Courts.

327. The qualification for enrolment as a vakil is usually the bachelorship of law, with some further distinction—either honours at the examination,
or a further test, or a certain number of years of practice. A law degree is not insisted on at Bombay and Allahabad, provided the prescribed examination is passed; but at the latter High Court two years’ attendance at a law college is required. A pleader must either have a law degree or have passed the examination prescribed by the court, for admission to which certain general educational qualifications are usually laid down. At Madras the candidate for the first grade pleadership must be a graduate; for the second grade an under-graduate. At Calcutta and Allahabad the intermediate standard is required, and also attendance at a law class recognised by the court. The qualification required in a mukhtar is generally the matriculation or its equivalent (in the Punjab the intermediate) and a special examination.

328. The pleadership examination entitles the successful candidate to plead in subordinate courts—such as those of district and sessions judges. A mukhtar (in provinces where this grade exists) generally practises (but does not plead) in the courts of subordinate judges; but in the Punjab he is permitted to practise in all civil courts subordinate to the Chief Court, and to plead in criminal courts inferior to the sessions court. It is not necessary now to enter into the qualifications of attorneys or differences of nomenclature found in different provinces.

329. This preface is necessary in order to show the precise place occupied by those who have undergone their legal training in India and the functions of the universities in connection with that training. As to the former, it will have been observed that barristers have generally the advantage over those trained in India for purposes of enrolment as advocates and practice upon the original side of High and Chief Courts. The Indian law degrees can be obtained only after graduation in arts or science, and by success in a searching examination. This has led many Indians to utilise the easier though more expensive conditions leading to a call to the bar. The resultant anomaly of “England-retumed” barristers of no outstanding ability, ranking above purely Indian products of repute and experience, has recently attracted attention. The High Court of Calcutta has adopted the measures detailed above for ensuring a due measure of general qualifications in those who are enrolled as its advocates; and the High Court of Bombay has prescribed the condition of one year’s practice in chambers.

330. As to the functions of the universities, these bodies prescribe and conduct examinations which are recognised by the courts as qualifying successful candidates for enrolment under themselves or their subordinate courts in various grades. The courts further make use of educational institutions in that the pleadership classes, attendance at which is compulsory before the pleadership examination can be attempted, are connected with and generally held in arts colleges often in combination with law degree classes. But the special examinations for pleaderships are conducted by the High or Chief Courts.

331. The story of legal education is told in Mr. Nathan’s review*. The original Acts of incorporation empowered the universities to grant degrees in law. A sub-committee was appointed to consider the regulations for the three older universities. Instructed to follow the model of the London University, it found that the systems of Hindu and Muhammadan law and the procedure and practice of Indian courts rendered the mandate impossible of close fulfilment. Two systems of opposite character evolved themselves—concentration at single colleges in Madras, Bombay and the Punjab, the growth of classes at numerous local colleges in Bengal and the United Provinces. Bombay more properly assumed a mid-way position; for, while the Government Law College (more properly an evening school attached to the Elphinstone College) alone taught the full course, classes attached to other colleges could present pupils for the preliminary examination—a plan which has now been abolished. Both systems proved unsatisfactory and were found to produce “many graduates in law, but few real lawyers”; but the latter was the more unsatisfactory of the two, because instruction (inadequate in both) was often almost non-existent in widely dispersed classes. The following quotation from the report of the Calcutta University may be taken as typical:—“There was not a single college devoted entirely to the teaching of
law; and judged from the point of view of the requirements of the new regulations they were all found to be far below the mark. The arrangements made were wholly inadequate and could only be regarded as mere colourable compliance with the regulations. The students as a rule were found to be irregular and unpunctual in their attendance; and in the majority of cases discipline was found to be extremely lax." The report quotes the opinion of Sir Ashutosh Mukharji, the Vice-Chancellor:—"The majority of students have no books; they do not intend to listen to the lectures; very many of them are employed as teachers in schools or clerks in public offices, and their only anxiety is to get credit for attendance at a certain number of lectures as required by the university regulations; and it is by no means an unusual incident for a student to get himself marked present by a proxy."

The feature of the quinquennium has been the recognition of these facts accompanied by attempts at remedy—the establishment of central institutions, the reform of courses and the improvement of the condition of students by the opening of hostels.

332. Any action tending to render less easy the entry to a remunerative and attractive profession is naturally regarded with some opposition. The dual control over courses and examinations does not facilitate reform. It is therefore not surprising to find that in the Bengal (where opposition would naturally be most strong) the steps hitherto taken have resulted in a qualified success. Much, however, has been accomplished. Law colleges and classes numbered 35 in 1902 and 33 in 1907. They have now been reduced to 25, including two colleges which have not been shown in the Bengal general tables. There has been no falling off in students, who were 2,808 in 1902, and now are 3,046. On the other hand, not only has expenditure risen from Rs. 1,25,786 in 1902 and Rs. 1,57,008 in 1907 to Rs. 2,64,494 in 1912, but expenditure from provincial funds, which (owing to the cheap scale on which the schools were run and the theory that they must pay or more than pay for themselves) was a minus quantity in the two previous quinquennia, is now Rs. 37,093 a year; this means an increase of Rs. 40,640 since in 1907 government made Rs. 3,547 out of its classes. The changes in the way of concentration of institutions and improvement of staff, curricula and supervision are given in detail in the succeeding paragraphs.

333. Madras, Bombay, the Punjab, Burma and the Central Provinces (a) Concentration of teaching.

In Madras the Government Law College prepares graduates for the B.L. degree and for the first grade pleadership examination, and those who have passed the intermediate for the second grade pleadership. It is self-supporting. The strengthening of the staff was under consideration at the close of the period and has since been sanctioned. The Law College at Lahore is maintained by the university. A whole-time staff was appointed during the quinquennium, and expenditure rose from Rs. 11,345 to Rs. 24,585, most of which is covered by fees. The vernacular classes have been abolished, the examination results improved and a hostel opened. In Bombay, too, there is now only one institution—the Government Law School (classed as a college). At the beginning of the quinquennium, six mofussil colleges were also recognised as preparing for the preliminary L.L.D. In 1907, Dr. Selby pointed out that if a full-time college with non-practising tutors could be established, the course of study might be reduced to two years after graduation and the mofussil classes might disappear. The course has been so reduced; the classes have vanished; but the law school (at the Elphinstone College) is still an evening school, where, as Mr. Prior says, tired lecturers teach tired students, the whole course is not covered and the stipends are insufficient to attract the best lawyers as instructors. The school now contains 458 students and more than pays its own expenses, which amount to Rs. 26,144. The surplus funds are being accumulated for a building.

Partial concentration has taken place in the Bengal and the United Provinces. Central institutions have been established; but, while local classes

*All are now classed as colleges save one—the school in Rangoon. This institution was omitted from the supplemental table in the last review.
have been diminished, they have by no means been extinguished. The University of Allahabad opened a law college in 1907, which already contains 304 students—considerably over half the total in the province. But the increase in the number of these (from 307 to 559 during the period) and the want of a proper habitation for the central institution have contributed to the continuance of classes. The total number of institutions is now five as against six in 1906-07. The University College has a whole-time principal, a professor and two assistant professors. The work is carried on in the Muir Central College. But the classes are over-large for the rooms and will shortly be accommodated in the new senate hall. The erection of a separate building and of a hostel is under contemplation. Bengal and Eastern Bengal and Assam have been affected by the new regulations, the lengthening of the course and the general sense of dissatisfaction at the existing state of affairs. In Bengal four government and certain private colleges previously maintained law classes. In the former the classes had to pay their way, in some at least of the latter they were sources of considerable income. In 1908-09 the system was changed. A University Law College was opened at Calcutta, with a whole-time principal, three professors and eight assistant professors. It contains 639 students and costs nearly Rs. 62,000 a year, of which Rs. 25,500 comes from provincial resources. To provide for Bihar, the classes at the Patna College were not only continued, but raised to the status of a second law college both for B.L. and for pleadership students. It has a whole-time principal and four lecturers for 41 degree students, and one lecturer for 30 students reading for the pleadership examination. To provide for Orissa, six scholarships of Rs. 30 a month, tenable for two years, have been instituted at Patna. The other B.L. classes attached to the government colleges at Hooghly, Krishnagar and Cuttack were closed; they also disappeared at all private colleges save the Ripon in Calcutta. So much for degree classes. But pleadership classes have not only been continued at the City, Ripon and Metropolitan Colleges in Calcutta, and at the Midnapore, Berhampore and Tej Narayan Colleges, but (in view of local needs) have been started at the government arts colleges of Hooghly, Krishnagar and Ravenshaw (Cuttack), and (as stated above) at the Government Patna Law College. The result of this is that there are eleven colleges or classes (all are classed as colleges), of which three teach the B.L. course, and the remainder the pleadership course (two of the latter, viz., Hooghly and City Colleges which had no pupils, have not been shown in general table III): three are government institutions, one (Midnapore) is municipal, one is aided and four are unaided. The University College is strictly an aided institution, but has been shown as one managed by government in the Bengal general tables. The number of students is 1,146 against 1,272 in 1907, the total expenditure was Rs. 1,10,390 against Rs. 43,141 and the expenditure from provincial funds was Rs. 39,725. A somewhat similar process has taken place in Eastern Bengal and Assam due to the same causes. The B.L. classes at the Dacca, Rajshahi and Braja Mohan Colleges have been closed. A single college has been opened at Dacca, of which the principal is identical with the principal of the arts college, while one whole-time and two half-time professors have been appointed. At the same time, however, classes (with insignificant numbers) for the pleadership examination continue to be attached to the Dacca, Rajshahi and Chittagong Colleges and (in Assam) to the high school at Gauhati.

In Burma the Government College at Rangoon has a small class of ten students. There are now no B.L. students. It is suggested that this is the result of the extension of the course to three years: and the professor considers the Calcutta University courses ill-adapted to the needs of Burman students, though certain changes in the regulations to meet Buddhist requirements have been made by the university. In the Central Provinces the class at Jubbulpore has been abolished and the teaching of law is now confined to the Morris College at Nagpur. The number of students is 77, having doubled in the quinquennium; expenditure has likewise doubled and now stands at Rs. 9,917, of which Rs. 4,333 is met from provincial revenues.

(b) The staff.

334. It will be observed that there has been a tendency to appoint full-time principals. These are generally assisted by professors who, with few
exceptions, are practising lawyers. This latter scheme is in accordance with the recommendation of the Universities Commission and has the advantage of utilising the services of men who are actively engaged in the profession.

335. Mr. Orange described at length the changes in the courses effected (c) The courses, under the new regulations. In the present review, the courses and the most recent changes in them are briefly indicated in appendix IV and shown at greater length in appendix XIX. The most important modifications have been at Calcutta and Bombay. At the former university the B.L. course has been prolonged to three years, or to two and a half years in the case of those placed in the first division at the preliminary examination.

At Bombay the course was of three years and commenced immediately after the passing of the intermediate, the first LL.B. examination being held after one year's study. It has now been reduced to two years and made wholly post-graduate. The resultant closure of the classes subsidiary to the Government Law School has been already noticed. At all universities the course now commences after graduation and (save at Calcutta) occupies two years. It ordinarily includes jurisprudence, Roman law, Hindu and Muhammadan law, the law relating to persons and property, contracts and torts, evidence and civil procedure, crimes and criminal procedure, etc. The principles of equity and of legislation, international law and other subjects are generally added either as integral parts of the course, for honours or for the higher degree. An examination in some portion of the subjects for the B.L. or LL.B. is held at the end of each year of study. The final examination results show a slight improvement upon those in previous periods. Of 1,530 candidates presented in 1912, 741 passed. The higher degree of M.L. or LL.M. is also conferred on the result of an examination, ordinarily after two years' study subsequent to the bachelorship; the Punjab University offers no such degree. All universities save Bombay offer a D.L. or LL.D. degree on presentation of a thesis.

As regards the pleadership examination, it will suffice to say that this is a test held under the control of the High or Chief Courts, generally as an alternative to the possession of a law degree. Though the classes are held in conjunction with the college classes for the degree, and though some university qualification is generally required as a condition of entrance to the examination, the test itself is under the control of the court. The same is the case with the examination for mukhtars, save in the Punjab, where it is under the control of the university.

336. The old type law class was (and, where it persists, still is) held in a (d) Collegiate class room of an arts college in the early morning or the late evening. The law-lecturer would come in for an hour or so, mentally absorbed in preparation for his day's work in the court or fatigued at its conclusion. Such of the students as deemed it incumbent on them to put in an appearance would straggle in, and hurry off at the earliest opportunity to their own labours (not infrequently those of a teacher in some neighbouring high school). There was no sort of corporate life, no special building, no library, no supervision. A certain amount has recently been done by way of supplying these institutions with local habitations. The Madras Law College has a fine building. The University Law College at Calcutta is held in the new Darbhanga buildings, while that at Allahabad will be located in the new senate hall as soon as it is ready for use. The law colleges at Bombay, Nagpur, Dacca and Rangoon are held in the rooms of the government arts colleges at those places, and at Lahore apparently in hired buildings. Libraries, too, have been provided in certain cases. The Calcutta University Law College and the Patna Law College have made ample provision. The Punjab Law College has a fairly valuable library. There is also a library in the Madras Law College. The Allahabad University propose to establish a library of their own with a portion of the imperial grants recently made and this will no doubt provide for legal studies.

337. More important still is the recognition of the necessity for making residential provision for a class of students who, though older than the majority of arts students, must often be driven to lodge in insanitary and undesirable places among surroundings wholly unfavourable to a proper upbringing.
Hostels are attached to the Patna Law College as well as to the Punjab Law College. The Calcutta University College hostel has already been erected with the aid of a grant of three lakhs. It is under contemplation to construct hostels for the University Law College at Allahabad and Rs. 1.05 lakhs has been granted towards its erection. A start has been made, but much still remains to be done.

III.—Medicine.

338. Medical education in India is imparted in medical colleges or schools, according to the standard of qualification required. The colleges are affiliated to universities, and their curriculum is designed primarily to meet the requirements of those who desire university degrees; but, as in Europe, some cater also for the class of students aiming only at a diploma qualifying them to practise medicine in India. A brief description of the main changes in courses, etc., has been given in chapter V and appendix IV.

339. In some colleges special courses are held in subjects which are only indirectly concerned with the practice of medicine; for example, at Madras there are classes for compounders, dhais (midwives), and sanitary inspectors. In other parts of India these subjects are generally taught in the schools.

All the colleges admit students of both sexes; and the great majority enter with the deliberate intention of procuring service under government. The students may roughly be divided into the following classes:

(a) Indians who are under training to become "civil assistant surgeons" under the provincial administrations. These were formerly required to obtain only a licence to practise medicine and surgery; but the standard has recently been raised, and they now have to undergo a six years' course of study and obtain the university degree which has taken the place of the old L.M.S., save in Madras and (for the present) in Bombay.

(b) Military students, who are Europeans or members of the domiciled community, and are educated at the expense of the state to the standard required for the military assistant surgeon branch of the Indian subordinate medical department. These students do not matriculate, and they are admitted after a competitive examination in general knowledge which is nothing like as severe as that required from university students. Military students are given diplomas by the colleges; none of them go on to obtain a university degree.

(c) Casual students, male and female. These are studying medicine with the intention of becoming private practitioners.

(d) Post graduate students. These are to be found in Madras College, where classes are held for civil sub-assistant surgeons after completion of seven years' service.

340. Medical schools, as distinct from colleges, are not affiliated to universities. They give a 4-year curriculum, with a school diploma or licence to practise. Theoretically they demand the preliminary standard of matriculation into a university before admission; it has, however, up to the present, been found quite impossible to insist on this standard; and students with lower qualifications have to be accepted. The instruction is now imparted in English.

The male students at the schools are almost entirely candidates for employment under the state as military or civil " sub-assistant surgeons." Many of the female students, too, are similarly intending to enter the provincial subordinate medical service, or the hospitals administered by the Dufferin fund. The remainder, of both sexes,—as yet a small number—ultimately go into private practice, or take service under commercial bodies, such as mines, tea gardens, shipping companies and the like.

341. Individual medical colleges are dealt with in the succeeding paragraphs and an account of the government medical schools is given in appendix XX. The number of colleges has during the quinquennium increased from 4 to 5 and of scholars from 1,542 to 1,822. Institutions for medical instruction (including both colleges and schools) have increased from 31 to 33; pupils from 4,720 to 6,044, and the direct expenditure on such institutions from
Rs. 10,69,451 to Rs. 13,62,227. The total expenditure in different institutions for the years 1907—1912 is shown in appendix XXI. The expenditure from public funds has risen from Rs. 8,97,365 to Rs. 9,58,678 during the same period.*

342. There are now five medical colleges:

The Medical College of Madras.
The Grant Medical College, Bombay.
The Medical College of Bengal, Calcutta.
The Medical College of Lahore.
King George's Medical College, Lucknow.

The last is a new institution, only recently opened.

The number of students attending these colleges at the beginning and end of the quinquennium was as follows:

<table>
<thead>
<tr>
<th></th>
<th>1907</th>
<th>1912</th>
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</thead>
<tbody>
<tr>
<td>Madras</td>
<td>195</td>
<td>423</td>
</tr>
<tr>
<td>Bombay</td>
<td>679</td>
<td>531</td>
</tr>
<tr>
<td>Calcutta</td>
<td>435</td>
<td>612</td>
</tr>
<tr>
<td>Lahore</td>
<td>243</td>
<td>156</td>
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<tr>
<td>Lucknow</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>1,542</td>
<td>1,822</td>
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</tbody>
</table>

The main changes in the previous quinquennium (which saw the introduction of new regulations in the universities) were the abolition of the Licence in Medicine and Surgery (L.M.S.) in two out of the five universities, and the breaking up, for purposes of specialisation, of the M.D. degree. These reforms have been continued during the period under review.

The changes in curriculum, in connection with the abolition of the Licence in Medicine and Surgery, and the substitution for it of the degree of bachelor of medicine, have necessitated numerous additions to the teaching staffs of the colleges, which, along with other matters of interest, are detailed below. In most of the colleges there has been a decline in the number of students, which is partly the result of the higher standards of preliminary education demanded before admission, and partly of the deterring effects of the longer course now required for a university degree. It is expected, however, that this decline will be found to be purely temporary, as, indeed, it has already proved to be at Calcutta.

343. At the Madras college the physiological and hygiene laboratories Medical have been completed. The construction of hostels for civil and military students is still under consideration. More lecture theatres are urgently required. There is no suitable accommodation for the teaching of pathology, and it is proposed to create a pathological institute, under the charge of the professor of pathology, who will also be responsible for instruction in bacteriology.

A lecturer in physics has been appointed, thus relieving the professor of chemistry of the duty of teaching this subject. A committee has enquired into the whole constitution and staffing of the college, and the recommendations made are now under consideration. Briefly, it is proposed to create whole-time major professorships of chemistry, physiology, anatomy, pathology and medical jurisprudence, and to add a minor chair of clinical and operative surgery.

The number of students has increased from 157 to 423. Of those working in the college department, i.e., those who are studying for the M.B., C.M. or L.M.S. qualifications, there are now 296. There are 12 female students in this department, a slight decrease. The chemist and druggist department

* These figures and those of expenditure differ from the figures given in the general tables and in the supplemental tables. The figures in the general tables are vitiated by the fact that medical colleges and schools are altogether omitted in the Madras report. The supplemental tables have been rectified as far as possible by the addition of the Madras figures for 1911. The figures quoted in the body of the report are taken partly from the supplemental tables and partly from figures supplied by the office of the Director General, Indian Medical Service.
still fails to attract students, although the standard for admission has been lowered. The sanitary inspectors' class, however, numbering about 40 students, has been very successful.

The number of students who qualify tends to rise; in 1907-08 eighteen passed out (eleven L.M.S., seven M.B.), in the latest return thirty-two obtained the L.M.S. and eleven obtained the M.B.

344. During the quinquennium some very necessary additions were made to the college in Bombay. The new bacteriological and biological laboratories were opened in 1907-08, a pathological laboratory in 1909, and a hostel to accommodate 240 civil students. The hired quarters reserved for the use of military students having been found to be inconvenient and unsatisfactory, it has been decided to build a new one; and plans are under consideration.

Several important changes have been made in the staff to meet the requirements of the new curriculum. A whole-time professorship of physics was created in 1909-10, and whole-time chairs of pathology and anatomy have just been sanctioned by the Secretary of State, and will be filled at once. The professor of pathology will be an I.M.S. officer, but the chair of anatomy will probably be filled by an Indian.

Lecturerships on diseases of the ear, nose, throat, on anaesthetics, on electro-therapeutics and on skin diseases have been created; also tutorships in bacteriology and ophthalmology. On the other hand, with the disappearance of botany as a subject of examination, the minor chair in that branch of science has been abolished.

At the commencement of the quinquennium there were 638 civil and 41 military students; at the end, the corresponding figures were 496 and 35. There has thus been a decrease amounting to 142 civil students, which is ascribed to the increasing severity of the examinations and to a larger number of students withdrawing during their course. There are now 29 female students, as compared with 25 in 1907.

345. During the quinquennium the Calcutta medical college and hospital have been modernised and the teaching accommodation has been greatly improved. The fourth or administrative block was completed in 1912, and there are now an examination hall, a spacious office and library, students' common room, waiting room for female students and a professors' room. The new anatomical museum was opened in 1909. Certain buildings are still urgently required, viz., biological, physical and pharmacological laboratories, a refreshment room for students and a hostel for civil students. The first of these will be included in the scheme for the creation of a school of tropical medicine, referred to later, which it is hoped will shortly be taken in hand. The need for a hostel was noted in the last report, and is more urgent than ever owing to the increase in Calcutta house rents.

The introduction of the new regulations rendered necessary the appointment of a whole-time professor of biology, and the inauguration of a special biological department. An officer was appointed in 1908-09, but the work is hampered by the absence of a special laboratory. A whole-time professor of anatomy was appointed in 1912, relieving the second surgeon of the hospital of this duty.

The number of students continues to rise steadily. The average number of regular students has risen from 454 in 1908 to 612 in 1911-12, and of these an average of 17 are women. The military class does not fluctuate much, but the number of "female certificate" class students has declined from 10 to 5. The number of students who qualified has fallen from 69 (67 L.M.S. and 2 M.B.) in 1907-08 to 53 (50 L.M.S. and 3 M.B.); this decline is due to the much greater stringency of the M.B. examination. The number of failures in the preliminary scientific examination is noticeable, and it appears probable that the new matriculation is not a sufficiently searching test of the capability of the individual to undertake further study.

There has long been a demand for a qualification in the subject of tropical medicine, such as is granted by some of the universities and examining bodies in the United Kingdom. It has now been decided that a diploma of tropical medicine (D.T.M.) shall be given by the Calcutta University. The corollary
to this decision is the creation of a school of tropical medicine; and sanction has recently been received for this from the Secretary of State. The new school will form part of the Medical College, from which its staff will be drawn. The course at this school will be a post-graduate one, and will be open to all medical officers and subordinates serving under government as well as to the profession generally.

346. The higher standard of preliminary education demanded by the Revised Medical Regulations and the abolition of the L.M.S. qualification have resulted in a reduction in the number of students at Lahore. Moreover, preliminary science teaching is now given at the Government College and other institutions. Students of other universities than the Punjab are now ineligible for admission. The actual decline is from 257 students at the end of the last quinquennium to 156 at the end of the present one. This decline will, it is believed, cease automatically when the science faculty can pass more students than it has hitherto done. At present all the students are studying for the M.B.B.S. degree of the university. The association of the medical school with the college continues; the proposal to separate them, long looked for, has not yet proved feasible. There is a proposal, in connection with the King Edward VII Memorial scheme, to have a new college building in addition to extensions of those existing, as well as a hostel for civil students. The number of students who qualify has increased; in 1907-08, 13 passed the L.M.S. or old M.B., whereas, in 1911-12, 26 qualified under the old rules and 10 obtained the new M.B.B.S.

A professor of pathology and tutors in medicine, materia medica and physiology were appointed in 1908, and professors of gynaecology and ophthalmology in the following year. The three house surgeons have also been utilised as clinical assistants, and a demonstrator of anatomy has been added to the staff.

347. The college at Lucknow, which is affiliated to the Allahabad University, has only recently been opened. It has had the advantage of the experience of other colleges and is equipped, both from the point of view of staff and accommodation, in the most up-to-date manner. There are at present sanctioned whole-time professors of surgery, medicine, pathology, physiology, anatomy and materia medica; as the students are now only in their second year, only the last three are actually employed. The college will fill a much felt want, and will relieve Calcutta and Lahore of the students who formerly came to them from the United Provinces. The course of instruction is designed for students working for the M.B., Allahabad.

348. The X-Ray Institute continues to impart instruction to those who desire a working knowledge of skiagraphy. Primarily intended to train officers for military purposes, it now has courses for officers and subordinates in military and civil employment; and although some 50 individuals are trained yearly, there is always a demand for admission. A well-marked demand for a longer course, covering electro-therapy, is also evident; and the extension of the scope of the institute is under consideration.

The Central Research Institute, Kasauli, has now become an educational institution; classes of instruction in bacteriological technique are held there six times a year, and these classes are open to selected officers and subordinates in government service. Here again the demand for admission is greater than the available accommodation. Special classes are also held twice a year for instruction in the study of malaria, and are well attended. Finally, opportunities are afforded for research at the institute, under the guidance of the staff.

IV.—Engineering and surveying.

349. Colleges and schools of engineering prepare students for service in the Public Works Department, or as civil, mechanical and electrical engineers in other employ. Some of them also contain classes of a distinctly industrial character. Hence it is not always possible to distinguish between what may be termed the 'professional' and the 'industrial' institution, or between students of these two classes in a single institution. Each large province, however, contains an engineering institution. Madras, Bombay, Bengal and the United Provinces have colleges. These prepare students for the univer-
sity degrees (save in the United Provinces, where the university has no faculty of engineering and the college at Roorkee bestows its own diplomas) and for superior posts in the service. The changes in the university courses have already been indicated in the chapter on universities and in appendix IV. At Calcutta, Bombay and Madras the course commences after the intermediate, and is now specialised in its later stages. The Punjab University alone has a lower course commencing after matriculation. They also prepare pupils of lower original qualifications as overseers and sub-overseers for the subordinate service. In some provinces there are a few guaranteed posts; and sometimes practical training under the public works department is arranged after the completion of the college course. The Punjab and Burma contain each a school—a kind of lesser engineering college—and a privately managed college in Lahore also is affiliated for the engineering certificate of the Punjab University. The Central Provinces is building one. In addition to the college at Sibpur, Bengal and Eastern Bengal and Assam have a number of schools which train up to the overseer and sub-overseer standards. It is interesting to notice that bifurcation in special studies is contemplated in the higher of these schools. Engineering institutions frequently contain technical and industrial classes (these are prominent at Sibpur and Roorkee) and survey classes. Supplemental table no. 138 shows only colleges, since the schools are classed in the returns with purely technical and industrial institutions. But schools as well as colleges are described, province by province, in the following paragraphs.

Institutions :

(a) in Madras.

350. The College of Engineering at Madras was reorganised after 1904 with courses of three years for civil and mechanical engineers, and for upper and lower subordinates. The former courses are open only to graduates, the latter to those who have passed the intermediate and the matriculation respectively. It has now been decided to open a probationary subordinate class consisting of matriculates and holders of the school leaving certificate. This will in future form the lower subordinate class; and out of it will be chosen thirty students who have shown their fitness during the first two years of study and will compose the upper subordinate class. An assistant instructor of civil engineering has been added to the staff; and the subordinate staff is in future to be recruited from the public works department, officers being transferred to the college for three years only with a view to ensure their being in touch with practical work. The non-university examinations have been placed in the hands of the staff. It is proposed to erect new buildings for the college near Adyar.

Sir A. Bourne says that this college is the only institution in the presidency that can be called a school of engineering and surveying. There are, however, (apart from schools for Europeans) three schools which offer the subject:—(i) Chengalvaraya Naicker's Technical Institute at Vepery. In 1911 it contained 35 pupils studying civil engineering, 98 under training as mechanical foremen and fitters, and 87 studying machine-drawing, construction, etc. It received large grants for machinery during the quinquennium.

(ii) and (iii) The Madura Technical Institute and the Teppakulam Institute of Mechanical Engineering at Trichinopoly are doing similar work on a smaller scale. The latter has electrical engineering classes.

(b) in Bombay.

351. The Bombay presidency has the College of Engineering, Poona. It contains a university branch, in which most of the students are found, and mechanical and electrical branches. "This college," says Mr. Prior, "has passed through a quinquennium of considerable change and activity. The chief features of the period are the transfer of the classes in agriculture to the new Agricultural College in 1907-08; the opening of a technical normal class for workshop students in 1909; the discontinuance in 1911 of the B.Sc. degree course; and the change of the name of the institution from 'College of Science' to 'College of Engineering'; the taking of the degree of B.E. (Civil) by students, for the first time, in 1911; the opening of the new hostel for 76 students in 1907; the completion of the new chemical and geological laboratories and museum and a new wing of the main building, including a lecture-hall for physics in 1908; the completion of a new hostel for apprentice-students in 1910; extensions of the workshops in 1908 and 1911; the commencement of the new engineering laboratory in 1912; the appointment of a
professor of mechanical engineering in 1908 and of an assistant professor of the same subject in 1909; and the appointment of separate professors of chemistry and geology. It is interesting to notice that geological and engineering tours have been organised, the latter to irrigation works, tanks, drainage and sewage works and to the Tata works at Lanoli. An engineering laboratory is under construction and will, it is said, be the finest of its kind in India.

There are three small aided engineering classes, the largest of which is attached to the Dayaram Jethmal Sind College at Karachi.

352. The organisation in Bengal and Eastern Bengal and Assam is peculiar. The two provinces may conveniently be treated together. A single system of training matriculates for subordinate posts in the public works department prevails. This training is carried out in a number of technical schools (really minor engineering schools which teach only to the sub-overseer standard), in the two schools of engineering and in the apprentice department of the college (in all three of which instruction is continued to the overseer standard and the foreman mechanics' certificate). A single joint board of technical examinations supervises the tests for the overseer and sub-overseer classes and also for 'B' classes in high schools, and performs other functions. Finally, a single college (the Civil Engineering College at Sibpur, close to Calcutta) instructs those who have passed the intermediate in a degree course under the Calcutta University whose degree admits to higher posts in the public works department.

353. This college is the central institution for the two provinces, and arrangements are made for reserving vacancies in the classes for pupils domiciled in Eastern Bengal and Assam. Its work is of a singularly varied nature, and may be divided as follows:—(i) The engineer department admits those who have passed the intermediate (in practice many graduates also enter it), teaches up to the university B.E. degree and thus prepares its students for the engineer branch of the public works department or for industrial employment. The university course consists of two stages, the I.E. and the B.E. (intermediate and bachelor in engineering). The intermediate is now taken at the end of the second instead of the third year of the course, and the major portion of the mathematics and science has been removed to it with a view to concentration on the professional subjects during the subsequent two years (in place of one year) which now intervene between this examination and the degree. This change has made the intermediate more difficult to pass, but has increased the percentage of success in the degree examination. After the intermediate stage the university regulations prescribe separate specialised courses for the B.E., viz., (a) civil, (b) mechanical and electrical and (c) mining engineering. The two second branches, however, exist as yet only on paper, no provision having been made for their teaching. Thus the college in its engineer department trains for the public works department, and B.E.'s are eligible for appointment in its engineer branch. A certain number of B.E.'s are annually sent for practical training to that department, and compete for an annually guaranteed post of assistant engineer. (ii) The apprentice department admits matriculates and Europeans who have passed an equivalent examination. These undergo three courses: (a) a two years' course leading up to the sub-overseer examination, (b) a one and a half years' course leading up to the third grade overseer examination, (c) a one and a half years' practical training leading up to examination for the certificate of foreman mechanic or of foreman mechanic and sub-engineer. The sub-overseer course is also taught in the smaller technical schools and the two schools of engineering. The latter also teach the courses designated (b) and (c) above. The examinations are conducted by the joint board of technical examinations. In future the overseer examination will be divided into two branches—that of civil engineering and that of mechanical and electrical engineering. Classes for this latter branch have been started at Sibpur and Dacca. (iii) Though provision is still lacking for instruction up to the degree in mining engineering, a two years' course in mining is open to those who have passed the sub-overseer examination. This, however, together with the classes in the mining districts, will be more conveniently described in the chapter on technical and industrial education.
A department of tinctorial chemistry was opened in 1910, and Mr. R. N. Sen, M.Sc. (Leeds University), was placed in charge. The class does not seem to have attracted many students. In 1908 short courses were opened to selected telegraphists for training as sub-assistant superintendents of telegraphs. In 1907 a motor driver mechanic class was opened, but closed after three years, as sufficient opportunities for training presented themselves in the local workshops.

The changes in courses have necessitated some changes in the staff, the most important of which are the abolition of the staff of the agricultural department (now discontinued), and the addition of the professor of tinctorial chemistry and four demonstrators in various subjects.

Throughout the quinquennium the question has been debated of the removal of the college from its present unhealthy site at Sibpur—a river site on the Hooghly, which would be of great value for port and commercial purposes. It was at first decided to transfer the institution to Ranchi. But criticisms were advanced against the idea of locating branches of technical education at a place so far removed from industrial centres. "The matter was finally referred," says the report, "by government to a large and representative committee for consideration; and though a definite decision has not yet been arrived at, the probabilities now are that, in accordance with the general tenor of the recommendations of the committee, a technological institute will be established in Calcutta, the mining classes will be moved to Asansol, and the civil engineering department to a residential college in the mofussil, most likely in connection with the Dacca University."

For an understanding of the organisation of schools in these two provinces, it is necessary to explain that they consist of technical schools, which teach the sub-overseer course, and engineering schools, which teach both the sub-overseer, the overseer and the foreman mechanics' certificate course and are in fact replicas of the apprentice department at Sibpur. The entrance qualification to the sub-overseer course is the matriculation, or the 'B' final examination which completes an alternative high school course. As already stated, the sub-overseer course occupies two years. But a boy who has passed the 'B' final had already gone through some simple technical instruction and was permitted to enter straight into the second year. At the end of the quinquennium this was changed for reasons presently to be explained; and 'B' class pupils are now admitted only to the first year class. Those who have successfully completed the sub-overseer course can obtain service under government, local bodies or private persons; or they can proceed to one of the engineering schools or to Sibpur and there better their prospects by undergoing the overseer course for a year and also the foreman mechanics' for a further year and a half.

The schools of engineering are the Bihar School at Patna and the Ahsanulla School at Dacca. They are well-found schools under European engineers and teach the sub-overseer, overseer and foreman mechanics' certificate courses. They also contain survey classes for the training of amins. The former has recently become independent of the Patna College. It contains 188 pupils. The main departments at Dacca contain 287 pupils; and there are also artisan classes, which are really industrial. The school has been greatly improved and the staff strengthened. A hostel now provides for 108 pupils. An electric installation has been laid down which affords instruction to the pupils and lighting and fans to the Dacca Arts College, the school itself, the attached hostels and neighbouring residences. The school, though thus improved, is said no longer to meet the needs of the province.

Exclusive of schools for Europeans, there are also the technical schools, which teach the sub-overseer course and frequently have survey, artisan and other classes in addition. There are three of these in Bengal—at Bardwan, at Midnapore (the Maisadal Technical School) and at Ranchi. Eastern Bengal has five such schools, with 1,155 pupils. All are managed by district boards save that at Barisal, which was provincialised at the wish of its managers.
These engineering schools, especially those of higher grade, are very popular. The pupils ordinarily preferred for admission were those who have read in the 'B' classes of high schools (see paragraph 205), and those who have matriculated in a high division. The 'B' classes, however, which were organised as a modern or technical side of high schools, have not been an unqualified success. In the first place, they have proved unpopular in Bengal, where, in the last year, only seven passed the examination. In Eastern Bengal they proved more popular; and 1,195 pupils are reported to have attended them during the quinquennium. But the fact that out of this number only 180 passed the examination is significant. In both provinces the classes have been badly reported upon. As a rule," says the inspector of Chittagong, "only such boys as are likely to prove a certain failure in the general line obtain admission into the 'B' classes, and the result is that the few students who come to join it cut a sorry figure when they enter the sub-overseer class." Hence the product of these classes has now fallen into some disrepute, and the examining board have made proposals (since sanctioned) that, among the special subjects taught, engineering should be discontinued and only mensuration and elementary chain surveying retained, and that the privilege of admission to the second year of the sub-overseer course should be withdrawn.

357. The Civil Engineering College at Roorkee similarly trains engineers and subordinates for the United Provinces. Like the Sibpur College, this institution also makes provision for technical instruction and aims at being the engineering branch of the provincial technological institute. To this end a department of technology was established in 1909; but the first experience has not been very encouraging. A course of sanitary engineering has been introduced in the lower subordinate class. The other departments of the college have an industrial aspect and will be described in the appropriate chapter. A professor of mechanical engineering with subordinate staff was appointed in 1910. The addition of water-supply, extension of the workshops, increase of power, new chemical and electrical laboratories, new photo-mechanical rooms and an electric installation for lights and fans are among recent improvements. Hostels have been erected, and a new engineering laboratory constructed. The college makes arrangement for admission of Europeans. "Apart from class work," says Mr. de la Fosse, "the college is full of life. The volunteer has uniformly done well, and games of all kinds and athletic sports have been cultivated with keenness and assiduity. Two new outrigged fours from Oxford should, as the principal remarks, give a further impetus to rowing. The health and conduct of the students has been satisfactory. At the Allahabad Exhibition the college organised a special court of its own which was full of interesting exhibits of its work and its relations with the world of industry."

A useful development of this college, though it is not strictly educational, is the photo-mechanical and lithographic department. This has been considerably increased during the quinquennium and did useful work for the Imperial Durbar at Delhi and also publishes maps, etc. It is responsible for the illustrations which figure in the present volume.

In the Punjab, the school of engineering at Lahore was taken over by the government from the university in 1906. It was, says Mr. Godley, in an unsatisfactory condition at the opening of the quinquennium. A committee was appointed, and it was decided to remove the school from Lahore and to appoint a staff with higher engineering qualifications. "At the same time the number of annual admissions was restricted to 50, and an entrance test was instituted. The committee thought that stress should be laid, as at Roorkee, on the practical training of the students, rather than on their success in an university examination, if appointments in the public works department were to be given them. Subsequently a scheme was sanctioned for a new engineering school at Rasul, which should be under the charge of an assistant engineer; a staff of good qualifications was appointed, and the school moved into its new quarters in 1912. This change may be ranked as an important development in the history of technical and engineering education in the province."
This school and likewise the classes at the Dayanand Anglo-Vedic College, Lahore, are affiliated to the Punjab University for purposes of presenting students at the engineering certificate examinations.

358. The Government School of Engineering at Insein in Burma was reorganised during the quinquennium. It now contains (i) engineering and draughtsman’s courses of one, two or three years, open to matriculates or those who have passed an equivalent examination, and qualifying pupils for upper subordinates or draughtsmen in the public works department; (ii) a technical high school with a three-year course, open to those who have passed standard VII or the middle English examination, and qualifying pupils for lower subordinate posts. Mr. Covernton says, “New buildings and shops with new fittings and machinery have been provided, the school enjoys excellent accommodation and a fine compound, the staff has been increased and is well paid—and the numbers in attendance have fallen from sixty-three to thirty-five. The institution, avoided by the Burman and the European, has served as a refuge for domiciled Indians and immigrants of very mediocre educational attainments from the Punjab and other Indian provinces.”

Among the main causes for this want of success, he suggests the temperament and circumstances of the Burman, the absence of sufficiently attractive prospects, the length and expensiveness of the course and the alleged lack of adequate stipends—especially for Burmans. It is proposed to place the school under a public works officer of the imperial service. The Lieutenant-Governor observes in the resolution that the reorganisation has not achieved the success anticipated for it, states that a change has already been effected in its management, and hopes that it may yet justify its existence.

359. There was previously a civil engineering class attached to the arts college at Jubbulpore in the Central Provinces. It was unsuccessful and has now been abolished. Instead, a school for the instruction of civil and mechanical engineers is in course of erection at Nagpur.

Survey schools.

360. Survey schools are frequently attached to technical schools. The training in these institutions is for general purposes. The Survey of India trains its own men. Officers of the provincial service have been trained for the first year of their service under a senior provincial officer at Dehra Dun, instruction being given in triangulation, plane-tableing, traversing, levelling, computing, drawing and printing. On completion of this course they are posted to parties where they continue their training and at the same time undertake a certain amount of useful work. Each topographical circle has had a senior provincial officer holding the appointment of survey instructor in the circle. The upper subordinates and a certain number of the lower subordinates have, before being posted to parties, been trained for a year by the instructor of their circle. The remainder of the lower subordinates have been posted direct to parties and have been trained entirely in their party.

V.—Agriculture.

361. The dawn of the new era in agricultural education as a result of the progressive policy of the Government of India with reference to agriculture was adumbrated in the fifth quinquennial review. The measure of the progress made during the past quinquennium is the extent to which the proposals outlined have materialised and the efforts to supply a higher agricultural education have been successful in attracting students desirous of such a training. Before proceeding to a detailed examination of statistics by provinces it may be convenient to indicate the administrative and other changes which have taken place in the department of agriculture since the last quinquennial report was issued. The post of inspector general of agriculture in India ceased to exist as a separate appointment from the 1st April 1912. The functions of the inspector general of agriculture in India are now exercised by the director of the Agricultural Research Institute and principal of the Agricultural College, Pusa, under the title of “Agricultural Adviser to the Government of India and Director of the Agricultural Research Institute, Pusa.” He maintains the same position with
respect to Local Governments as was held by the inspector general of agriculture in India and his duties remain as before, except that he also discharges the duties of director of the Agricultural Research Institute, Pusa. In the provinces a mycologist and an entomologist have, during the quinquennium, been added to the staff of the Madras department of agriculture. The total number of officers in the Indian agricultural service is now 67 as against 55 at the end of the last quinquennium. There are now over 90 experimental farms and demonstration plots established in various parts of the country, in addition to botanical gardens and cattle farms controlled by the agricultural department. As a result of the development of the scheme for higher agricultural education, competent subordinate staffs have been recruited in all provinces for the supervision of farms and demonstration plots and to assist in the teaching and research at the Pusa Research Institute and in the provincial colleges.

362. The proposal to establish an agricultural college in Burma has been postponed for the present owing to the financial position of the province. It is also considered preferable, in the present state of general education in the province, to confine teaching in agricultural science and practice to short vernacular practical courses for actual cultivators. There are no agricultural colleges in Assam or Bengal. The Sabour Agricultural College, which was formerly under the Government of Bengal, has, owing to the recent territorial changes, come under the administration of the Government of Bihar and Orissa. But it receives students from the three provinces of Bengal, Bihar and Orissa and Assam and trains men for the departments of agriculture in these three provinces.

363. The Pusa Agricultural College and Research Institute was opened (i) The P. sa for students in July 1908. The teaching provided is of two kinds: (1) post-Agricultural College. and bacteriology and for one year in entomology, and (2) special courses for short periods in subjects such as the management of cattle, poultry, fruit growing and lac and silk production. The post-graduate courses are primarily intended for graduates of provincial colleges who wish to specialise in a particular subject with a view to obtaining assistant professorships or lecturerships in provincial institutions. The members taking these courses will, therefore, always be, to a large extent, limited by the number of appointments available, as provincial directors naturally only send students for whom they can guarantee appointments, while this source of recruitment will annually decrease as provincial departments become fully equipped. It is gratifying, however, to find that private students are now applying for admission to the post-graduate courses, and, though the total number of such private students is, so far, small, their presence is an indication of a genuine demand for higher scientific training for agricultural purposes.

Apart from the prescribed post-graduate courses in special subjects and in order to meet the definite requirements of provincial departments which are not in a position to train their own men for such appointments as assistant director, farm manager and the like, post-graduate students have been admitted to a general course including a period of study in each of the chief sections as well as practical work on the farm. It has, however, been held by the board of agriculture that, ordinarily, students requiring a practical agricultural training are best provided for in the six provincial colleges, and, now that these are all in full working order, it is not expected that there will be much further demand for the post-graduate general course.

The instructive staff consists of the director and principal of the college, who is also agricultural adviser to the Government of India, an agricultural chemist, a mycologist, an entomologist, an economic botanist, an agriculturist, an agricultural bacteriologist and a pathological entomologist. All these are imperial officers.

Students are trained in one or other of the following sections of agricultural science:

Agricultural chemistry.—Methods and principles of advanced research.
Mycology.—(a) Revisionary course in plant anatomy and physiology, (b) general mycology, and (c) pathological mycology.

Economic entomology.—(The course in this subject is for one year.)

Economic botany.—(a) Physiology of plants, (b) the improvement of plants, (c) the principles of Indian fruit-growing, (d) practical application of the principles of plant improvement and a general knowledge of the planting, cultivation and improvement of plants which are of special economic importance in their respective provinces.

Agriculture.—(a) A course in general agriculture and (b) special instruction in the management of field and garden crops and orchards and in the use of agricultural machinery, tools and implements and in cattle, sheep and poultry breeding and management.

Agricultural bacteriology.—(1) A complete two years' course of training in bacteriological technique as applied to soil bacteria. (2) A course in special methods of biological analysis of soils (to be included in course no. (1) and specially intended for agricultural chemists who may not have time to take the full course). (3) A course in bacterial diseases of plants to be taken up in the second year by such students as may show special aptitude for this line of research.

Short courses of instruction are also given in cattle breeding and poultry management, fruit culture, lac and silk production and in apiculture.

In 1908-09, the year in which the college was opened, the number of students enrolled in the post-graduate course was nineteen. It is now seven. The number of those who have successfully completed the course during the four years is nine. The students taking short courses have numbered during the four years 2, 49, 59, and 33 respectively, and all these have successfully completed their courses.

The reduction in the number attending the post-graduate courses is due to the fact that when the institute opened for teaching, provinces sent up, for a revisionary course, men who had already obtained some training in the agricultural institutions which then existed, so as to obtain assistants for the colleges which had just been opened. The demand for men has also, up to the present, been so great that provincial colleges have at once given appointments to the best of their students, without insisting on any post-graduate course, and have frequently withdrawn students deputed to Pusa before the completion of the course for which they were deputed. In addition, as the provincial colleges have not been open long, the supply of graduates for whom the post-graduate courses are intended has been very limited. Eventually it may be possible to insist on a post-graduate course at Pusa as a condition of appointment to the higher grades of the provincial agricultural service. The total expenditure has risen from Rs. 2,89,823 in 1907-08 to Rs. 3,19,860 in 1911-12.

364. The Poona Agricultural College, as distinct from the Poona College of Science, was constituted as a separate institution on the 1st January 1908. The college remained in its temporary quarters during the whole of 1908 and the early months of 1909 while the new college buildings were under construction. During the year 1911-12 the college was fully accommodated in its new buildings. The main college block was opened by His Excellency Sir George Clarke (now Lord Sydenham) on July 18th, 1911. The teaching staff of the Poona College of Agriculture consists of professors of chemistry, agriculture and botany with 11 assistant professors, lecturers and demonstrators. The college is affiliated to the Bombay University which confers a degree of bachelor of agriculture (B.Ag.) on the basis of the three years' course of instruction at the College of Agriculture.

The number of students varied but little during the quinquennium, and is now 104 as it was in 1907-08. Fifteen of these are studying a short course which was first started in 1909, is intended for farmers' and land-owners' sons.
and offers a practical training in the best methods of agriculture applicable to the province. The number of those who have passed the B.Ag. examination during the quinquennium is 134. The expenditure on the college has risen during the quinquennium from Rs. 23,036 to Rs. 94,500.

365. The Agricultural College at Coimbatore was opened on the 14th July 1909 by His Excellency Sir Arthur Lawley, Governor of Madras. The European staff consists of a principal and professor of agriculture, professors of agricultural chemistry, botany, mycology and entomology and a full establishment of assistant professors and lecturers. The Madras college has been more successful than any other in India in obtaining a large proportion of students of the desired class: about half being the sons of land-owners whose object is to acquire a knowledge of practical farming which will enable them to manage their own properties to better advantage.

The number of students has risen from 18 to 50. The number of those who have successfully completed the 3rd year course was 34 during the quinquennium. The expenditure has risen from Rs. 68,453 to Rs. 95,975.

366. Up to 1909 the only provincial institution which provided a higher agricultural education for the present provinces of Bengal, Bihar and Orissa and Assam was the Sibpur Engineering College. In view of the opening of the agricultural college at Sabour, it was arranged that the agricultural classes at Sibpur should be finally discontinued in 1909. Owing, however, to delay in construction, the opening of the Sabour college had to be postponed for a year and there was a consequent hiatus. To bridge this and to secure some continuity in agricultural training, students from Bengal were given scholarships to enable them to study at the Poona, Cawnpore and Nagpur colleges of agriculture. At the end of the agricultural year 1909-10, the Sabour college was practically ready to commence work, and it was opened on the 3rd November 1910 by His Honour the Lieutenant-Governor of Bengal.

The staff of the college consists of a professor of economic botany who is also principal of the college, a professor of agricultural chemistry and a professor of agriculture with a full staff of assistant professors and lecturers. The subjects taught are agriculture, chemistry, botany, mycology, entomology, physics, mathematics and veterinary science. In addition to the three years' course qualifying for the college diploma, a short six months' course in practical agriculture is also given. This course is for the benefit of landowners' and cultivators' sons and is confined to this class: it is strictly practical and the lectures are given in the vernacular.

The number of students admitted during the first year (1910-11) was 21. This, however, did not count towards the diploma course which began from June 1911. In 1911-12 there were 18 students, all of whom passed the annual examination in March and were promoted to the second year class. It may be noted that 41 applications were received for admission to the college in June 1912. Only 11 of the applicants joined: the remainder withdrew their applications on realising that a government appointment did not necessarily follow the acquisition of the college diploma.

The expenditure on the college during 1910-11 amounted to Rs. 66,094 and that for 1911-12 to Rs. 82,000.

367. Although the Cawnpore College and Research Laboratories were not formally opened till the 11th November 1911, work had been carried on for some time previously in the building and teaching had been greatly facilitated by the excellent laboratories. In 1907-08 the instructional staff had been brought almost to its full strength, consisting as it did of professors of agriculture, economic botany and agricultural chemistry with a full staff of lecturers and assistant professors. The first diploma examination was held during the session 1908-09: and, in this year, the college reached its full numerical strength.

Whilst no difficulty is experienced in filling the college with students, constant regret is expressed that the various land-holders' associations are slow to send students for training as land agents, even although such candidates are admitted on preferential terms. But the general quality of the
students, it is reported, tends to improve: and it is hoped that the proportion of students connected with the land may increase.

The college is under the administration of a governing body including a non-official element. This arrangement seems to work satisfactorily.

The staff of the college consists of 8 professors, 1 assistant professor and 5 lecturers. The number of students has risen from 103 to 122 and attained 153 in 1908. During the quinquennium 145 students have successfully completed the course. The expenditure has risen from Rs. 63,329 to Rs. 77,800.

368. During the greater part of the quinquennium, the Nagpur College has suffered from inadequate laboratory accommodation and a slight restriction of teaching staff. Teaching, however, was carried on regularly. There has been some difficulty in obtaining local students. The terms of admission were relaxed and it was proposed to admit such non-matriculates—the sons of cultivators—as could pass an entrance test equivalent to the matriculation standard. This scheme did not, however, prove a success. It is noted that the agriculturists of the Central Provinces do not appear to take kindly to higher agricultural education.

There are three professors on the college staff: a professor of agriculture, of agricultural chemistry and of economic botany. There is also a staff of assistant professors and lecturers. The enrolment has increased from 23 to 58 and 38 students have successfully completed the 3rd year course. The expenditure has risen from Rs. 24,928 to Rs. 38,860.

369. Although the Lyallpur College was not opened till September 1909, the anticipation of its foundation created a large amount of local interest. No less than 574 applications for admission were received, and of these a fair proportion came from land-owners and others whose main object was to acquire a scientific knowledge of agriculture. This preliminary enthusiasm was, however, damped by the decision to restrict the number of admissions, in the first year, to 16 as the teaching staff had not been fully recruited and trained in its duties. Ten open scholarships, two in each division, each of the value of Rs. 10 per mensem, were founded by the Local Government. Rai Sahib Mohan Lal founded a scholarship of Rs. 12 per mensem in memory of the late Sir Denzil Ibbetson, and Chowdhry Sultan Ahmed, extra assistant commissioner, endowed a silver medal to be named the "Sir James Wilson" Medal. The fees were raised to make the cost of the diploma equal to that of a B.A. degree. The boarding house fees were based on such a scale as to cover all expenses. This clear indication that the college course was not to be used as an easy and comparatively cheap road to government employment had its effect in a large decrease in applications for admission. The director of agriculture in his report for 1910-11 remarks that "the college is not popular with the classes we wish to attract, nor indeed with any class. It will not become popular until either the educated members of the agricultural classes begin to place an independent career above government service, or government holds out special prospects to those who obtain the diploma of L.Ag. By offering the latter temptation we could fill the college, but we should petrify its spirit."

A short practical vernacular course was started in October 1912, and the financial commissioner sanctioned the preparation of schemes for the improved farming of the large estates under the court of wards. Students who have obtained the diploma will be available for employment as agricultural experts on these estates.

The college staff consists of a professor of agriculture, of agricultural chemistry and of economic botany—each with an assistant, and an assistant professor of entomology. Lectures are also given in physics, mathematics, land revenue and surveying, agricultural engineering and veterinary science—the last two subjects by a member of the public works department and by the superintendent, civil veterinary department.

When the college opened in 1908 it had 16 students, in 1910-11 it had 65 and now it has 49. Eight students have passed the 3rd year course. The expenditure has risen from Rs. 57,561 in 1908-09 to Rs. 64,640.
370. Experience is already showing that the courses originally prescribed in the standard curriculum for provincial agricultural colleges, as laid down by the board of agriculture and amended in 1908, are, in most cases, not suited to the class of students that the colleges are intended for. Provincial reports are almost unanimous in tone. In Bombay, while the percentage of passes in the examination is high, the question of the utility of, and demand for, the course is obscured by its being made a road to a degree. College graduates or the subordinate staff have with very few exceptions continued to show no power to develop any original turn. In Madras there is noted in graduates "a lack of intelligent inquisitiveness and power of independent thought." Similarly in the Punjab "there is too much cram and too little power of practical application."

The division of the course into two parts and its extension to four years has been proposed, and there is no doubt that if the full course as prescribed by the board of agriculture is to be properly taught such an extension is absolutely necessary in every province. The Coimbatore College has already arranged for a preliminary two years' course which is to be agricultural, with lectures on popular science but no laboratory work. If the course of popular science is to receive an agricultural bias by the use of the phenomena of agriculture as a framework for the teaching of elementary science, the experiment is likely to give very valuable results from the point of view of rural secondary education.

On a general review of what has been achieved during the quinquennium it may perhaps be said that so far the most promising line of development in connection with the colleges is to be found in the extension of practical instruction which may vary from the mere demonstration to cultivators on their own land, up to a regular course for students on the farm attached to a college.

For some time to come, as is, to a large extent, the case in Great Britain, the prospect of employment in the higher grades of the agricultural service will limit recruitment for the diploma course: though ultimately there is hope that the colleges will attract genuine students for agricultural science' sake and the wealthier class of land-owner who will prefer a science course bearing on his life's work to a purely literary one.

371. In 1910 the Government of India accepted the proposal of the board of agriculture that passed students should be entitled licentiates of agriculture (L.Ag.). This degree will be recognised in all official publications. It has been left to each Local Government to decide what classes of appointment in government service should be thrown open to candidates who have obtained a degree from one of the agricultural colleges.

In this connection the question of the affiliation of agricultural colleges to the provincial universities was also considered. The conclusions arrived at are contained in the following extract from the Government of India resolution of the 4th January 1910:

"The Government of India did not consider that such affiliation was necessary at present. They thought it preferable that each agricultural college should be controlled by the director of agriculture with the advice of the director of public instruction. With the exception of the Government of Bombay all Local Governments and Administrations agree that affiliation is not desirable. In Bombay the circumstances are exceptional. The Poona College of Science has long been affiliated to the Bombay University for the purposes of examination for the existing L.Ag. degree and with the full concurrence of the Government of India it has been decided to continue an arrangement which has worked admirably in the past. But in all other provinces the principle may be accepted that the colleges should not apply for affiliation to the provincial university, and that for the present at any rate they should remain under the control of the directors of agriculture. The only further question is how far the director of public instruction should be associated in the control of the college. The Government of Madras are impressed by the risk that a system of dual control may lead to friction and want of continuity of policy, and they urge that while the director of agriculture should always be at liberty to consult the director of
public instruction, no rule requiring him to do so should be laid down. The Government of India have no wish in such a matter to restrict the discretion of Local Governments. But the question of the best means of co-ordinating agricultural education with general education is likely to become increasingly important in the future and they would draw attention to the great importance of arranging to keep the agricultural and educational departments in close touch with one another in such manner as may be most suitable in each province."

372. The following text-books have been published during the quinquennium:

(2) First Principles of Agriculture by F. Smith, B.Sc., F.H.A.S., deputy director of agriculture, Bengal.
(3) Indian Insect Life by Lefroy and Howlett.
(4) Wheat in India by Albert and Gabrielle Howard.
(5) A Hand-book of Agriculture for Burma (in English and Burmese), revised by the director of agriculture, Burma.

In addition, many leaflets and bulletins of an educational nature have been issued by the various departments of agriculture.

373. An important educative factor which has accompanied the expansion of facilities for higher agricultural education has been the provision of well-equipped libraries. At Pusa there is an excellent library of some 10,000 volumes containing standard works on all branches of agricultural and cognate sciences. It is largely used by the staff and by the students: while arrangements have also been made by which books are issued from the library to scientific workers in the provinces, whether connected with agricultural or with other scientific investigations. Advantage is freely taken of this arrangement. Similarly every provincial college and department has a well-equipped library which is kept up to date by the addition of any new publication of importance: and these are also, as a general rule, available for any scientific worker in the province. At Cawnpore a combined library for the agricultural college and the technological institute is under construction.

374. The broad principles upon which the agricultural education of the cultivating masses has been based are enunciated in paragraphs 554 and 555 of the last review. The past quinquennium has been marked by a consistent effort in all provinces to get into touch, by educative methods, with the actual cultivator and the sons of cultivators. Thus, in Bihar and Orissa, a short six months' course in practical agriculture is given at Sabour for the benefit solely of land-owners' and cultivators' sons. Lectures are given in the vernacular and the course, which is strictly practical, is said to be popular with the people and to meet a real want. Similarly the sons of cultivators were received for practical training at the agricultural stations at Cuttack and Bankipur. Agricultural classes held at the Gaya Zilla School and the Dumraon High School, however, proved a failure probably because there was little likelihood of pupils returning to the land. Nature study has been encouraged in the gurub-training schools, middle English and primary schools in Orissa by the grant of medals and diplomas by the agricultural department. This is an experiment at present confined to Orissa: but, if successful, it will probably be extended to other divisions. Again, classes for the training in arboriculture of overseers, sub-overseers and other subordinates of district boards are held at the Sibpur Botanical Garden. Sericultural classes for the sons of bonâ fide silk-rearers are held at Berhampur and Rajshahi. Little progress has been made in promoting agricultural education in schools, though a beginning has been made.

Bengal enjoys the same facilities for special courses in sericulture and arboriculture as Bihar and Orissa. During 1911-12 an attempt was made, both in Western and Eastern Bengal, to encourage nature study in elementary schools. Gardens have been attached to a considerable number of schools: seeds and simple apparatus for the illustration of the lessons have
been provided and manuals in the vernacular prepared for the guidance of teachers. It is too early to judge of the success of these measures; but some encouraging reports have been received.

In Assam, nature study is taught in primary schools. A new course has been introduced which differentiates between urban and rural schools and aims at providing for the pupils of each an education suited to their needs. Apprentices are trained at government farms for the post of fieldmen demonstrators.

In Bombay the short course for the benefit of land-owners' and farmers' sons forms an integral part of the educational scheme. There is a real demand for this course and the number of suitable candidates tends to increase. For this course a vernacular agricultural school was established at Poona in 1910. A school building and quarters for a vernacular school have been erected at Mirpurkhas in the Thar and Parkar district, Sind, where a 12 months' course in agriculture for the sons of zamindars, about 20 years of age, will be provided. The establishment of similar schools in the Deccan, southern Maratha country and Gujarat is under consideration.

In the Central Provinces short courses of practical instruction are given on the Powarkhara and Raipur farms and have met with great success. On the Raipur farm the training given is mostly in the transplanting of rice. Short courses are also given to wards and court of wards officials. The training of kamdars to demonstrate improvements on ryots' lands is one of the most important factors in the department's efficiency. The Nagpur malguzari class, formerly attached to the agricultural college, has, however, come to an end with the withdrawal of scholarships which appeared only to attract candidates who desired an easy means of access to service in tahsil and district offices. Practical instruction in definite improved local methods, with the minimum of explanatory theory, appears to be more useful, and classes with this object are being extended.

An important branch is the training of normal teachers so as to qualify them to teach "nature study." During 1908-09 twenty-three normal schoolmasters were trained at the agricultural college: the class was then discontinued as a course of "nature study" was introduced into four of the normal schools.

In the United Provinces applications are occasionally received from small zamindars and others for practical training in agriculture. To meet such cases, a small number have been admitted to the Cawnpore farm to enable them to gain an acquaintance with the methods pursued. The Rural Education Committee has introduced into village schools a series of object lessons dealing with insect life. The Eri silkworm has been chosen as the most suitable subject. Considerable attention is given to the provision of facilities for the training of engineers and sugar boilers for sugar factories. A grant was given to the owner of a factory at Pilibhit, one of the conditions of which was that he should receive for training a certain number of apprentices approved by government. In addition, special courses for training in sugar manufacture are, from time to time, organised at suitable centres. Courses of training in horticulture have been organised at Lucknow and Saharanpur. The farms are always willing to receive and train farm labourers if they are sent. Wages are paid, but few avail themselves of the opportunity. Courses for cultivators at experimental farms have not been tried systematically owing to the fear that cultivators are likely to be more impressed by experimental failures than by experimental successes.

In the Punjab lower agricultural education is at present limited to classes for instruction in the use of reapers and improved implements. Short practical courses have also been started at Lyallpur for the sons of bond fide cultivators.

In Burma, in the absence of an agricultural college, a scheme has been sanctioned for the creation of a staff of district vernacular agriculturists recruited mainly from the settlement and land records departments to serve as intermediaries between the agricultural department and co-operative credit societies as well as the public generally. Classes for the training
of this staff were also open to the general public and a considerable number of the sons of bond fide cultivators availed themselves of them. School gardens are extending in Burma: and a manual of school gardening has been prepared. The agricultural department gives what assistance it can in the organising of these schools. But it is doubtful if much progress can be made till facilities are provided for the systematic training of normal school pupils in nature study and the elements of agriculture. Anything so far achieved has been by special arrangement.

VI.—Forestry.

375. Forests covering approximately a quarter of the Indian Empire are under the control of the forest officers of British India and the native States, and the steady growth of this vast area is accompanied by the ever-increasing need for its more detailed and scientific management. It is not surprising, therefore, that the period under review has been one of almost exceptional development in education in forestry. The officers who receive their forest education in India are divided into three main classes:—

(a) deputy rangers, foresters and forest guards who constitute the lowest grades of supervising officers;

(b) rangers; and

(c) members of the provincial forest service.

376. For the first class the training, prior to 1907, was provided by vernacular classes at the Dehra Dun and Tharrawaddy forest schools, but in that year these classes at Dehra Dun were abolished, and arrangements have since been made in all the principal provinces for vernacular instruction to be provided in provincial classes or schools, subordinates from Bihar and Orissa being for the present trained at the Kurseong Forest School in Bengal.

377. As regards rangers, those for the Burma service received till 1907 a vernacular course at Tharrawaddy, and those for the rest of India an English course at Dehra Dun, the period of training in each case being two years. In 1908 the instruction at the Burma school was improved and given in English, while in 1912 the demands on Dehra were relieved by the constitution of a forest college at Coimbatore, which will ultimately provide all the requisite instruction for candidates from southern India.

378. Still greater progress has been made in connection with the provincial service in consequence of an arrangement made in 1906, by which the officers. members of this service, who had previously been selected exclusively from the lower staff, were in future to be selected to a large extent from candidates for direct appointment. In 1907 a third year course (in extension of the two years' rangers' course) was provided at Dehra Dun for such candidates, and in 1912 an entirely separate two years' course for provincial officers was substituted for the former combined arrangement.

379. These changes are the result of a policy deliberately undertaken by the government in 1906 for the improvement of scientific and technical education in forestry. As a consequence of this policy the old vernacular classes at Dehra Dun were abolished and the school raised to the status of a college. At the same time provision was made for a research institute to be worked in conjunction with and under the same management as the college. The conjunction of the college and institute has been productive of excellent results and, owing largely to the establishment of the latter, it is now possible to give in this country an education in forestry, which is of a much higher class than that obtainable formerly, and which may in time approximate to that obtainable in Europe.

380. The institution known as the Research Institute and College at Dehra Dun is under the administrative control of the inspector general of forests, who is assisted by the board of forestry, which meets triennially. The board of control referred to in the last review was abolished with effect from 1913. The staff consists of the president, the research officers, and the instructors. The president, who is usually a conservator, is charged with the general administration of both the institute and college, but is not connected with any
particular branch of research or study. The research officers comprise a sylviculturist, a forest botanist, a forest economist, a forest zoologist, and a forest chemist. The post of chemist is at present in abeyance. The research officers devote the greater portion of their time to research work, but during the rainy season they are also required to give lectures in their special subjects to the provincial service class. Almost up to the close of the period under review there were only four instructors, all members of the provincial service; but, partly because this arrangement proved to be not entirely satisfactory and partly owing to the introduction of the separate two years' course of training for the provincial service, it was found necessary to increase the staff to six, four (instructors) belonging to the imperial and two (assistant instructors) to the provincial service. Their principal duties, in addition to class-work at headquarters, are the supervision of the practical training in the forest and the maintenance of discipline.

The students fall into the following categories:

(i) Private students; usually men who hope, on obtaining the college certificate, to secure state or other employment.

(ii) Government probationary students, who may be stipendiary or non-stipendiary, and who have been selected by Local Governments for employment, subject to their completing the course of training satisfactorily.

(iii) Students deputed by native (and occasionally foreign) states and British colonies.

(iv) Students already in government service, usually forest subordinates.

The numbers in the rangers' and in the provincial service classes were, in 1907, respectively 45 and 7; in 1912, they were 55 and 15. Of the students in 1912, only one fell under class (i), none were non-stipendiary government students. Seven fell under class (iii), and the remainder were government stipendiary students. Twenty were Europeans or of the domiciled community, against six in 1907; one was a Siamese; the rest were Indians.

All students, except those already in government service, must ordinarily be between the ages of 18 and 25 on admission to the college, and must have undergone a period of practical training in the forests of the province from which they come. Rangers deputed for training must be under 30 years of age, and subordinates of lower rank must have completed two years' service and be under the age of 25.

Candidates for both courses must have a knowledge of English fully adequate to follow the course of instruction. For the provincial service course they are expected to know what is usually included in the term 'lower mathematics.' Local Governments may prescribe any other educational qualifications considered necessary, and the Government of India have, in this connection, emphasised the importance of at least a preliminary education in science. Candidates for the rangers' course must ordinarily have passed the matriculation, or its equivalents such as the European high school examination and the school leaving certificate, or a higher university standard.

The course of study (including vacations) extends over a period of two years, of which almost half is spent in camp. The teaching of late years has been more thorough, more comprehensive, and more up to date than in the past, though the classes have perhaps been rather too large to permit of that individual attention to the students, which is so essential if the best results are to be obtained.

The subjects taught in the provincial service course are as follows:

(1) Forestry, including sylviculture, utilization, and forest working-plans, both theoretical and practical, and forest mensuration.

(2) Physical science, including chemistry, physics, physiography, geology, mineralogy, and soils.
(3) Botany, both theoretical and practical, including the collection and preservation of plants.

(4) Zoology—the classification of animals and the study of useful and dangerous species, especially of insects, and the collection and preservation of specimens.

(5) Drawing, surveying, and estimating, as required for forest officers.

(6) Forest engineering, theoretical and practical.

(7) Forest law—the elements of criminal law, and departmental organization.

(8) Forest accounts and procedure.

The curriculum for the rangers' course is similar, but less advanced. Mineralogy and zoology are not taught, but instruction in arithmetic, elementary algebra, and mensuration, with special reference to their application to forest questions, is included.

Periodical and final examinations are held, the final examination counting for half the total number of examination marks allotted. Marks are also given for scientific collections, survey drawings, conduct, discipline, and application. The nature of the certificate awarded is determined by the total number of marks obtained.

Pass certificates are given in the provincial service class on 60 or more per cent. of the marks in each major subject and 60 per cent. of the total; honours certificates on 60 per cent. in each major subject and 75 per cent. of the total.

In the rangers' course, a lower standard certificate is given for pass marks in each major subject and 45 per cent. of the total, a higher standard on the same and 60 per cent. of the total, honours for 50 per cent. in each subject and 75 per cent. of the total.

The minimum cost of training, including subsistence money, uniform, books, camp outfit, and travelling expenses (exclusive of journeys by rail or steamer), may be estimated at Rs. 80 to Rs. 100 per mensem for the provincial service students and at Rs. 50 to Rs. 60 per mensem for the rangers' class, the cost for a European being somewhat higher than for an Indian.

The award of stipends is limited to Rs. 2,400 and Rs. 1,200 for the provincial service and rangers' courses respectively, the whole or part of which may be paid in a lump sum on the production by the student of such certificate as may have been agreed upon. The expenditure on stipends has risen from Rs. 51,515 in 1907 to Rs. 93,354 in 1912, and totals nearly four lakhs for the quinquennium.

The total expenditure under all forest heads incurred on the Forest Institute and College has risen from Rs. 1,65,158 in 1907 to Rs. 2,62,626 in 1912.

Rangers' class.

In the rangers' class, 33 appeared at the examination in 1907, and 52 in 1912. In the former year, two failed and one honours certificate was awarded; in the latter, one failed and eight honours certificates were awarded. The provincial service examination was first held in 1909-10, when all six candidates passed; in 1912, all fifteen candidates passed.

The Burma Forest School was established in 1899 at Tharrawaddy, mainly because the vernacular course of instruction given in Urdu at Dehra Dun could not be followed by candidates from Burma. In 1908, following on a suggestion made by the Government of India, an English course was started, and, as Tharrawaddy was considered an unsuitable locality, the school was, in 1910, moved to Pyinmana. The rules regulating the constitution of and studies and discipline at the Burma school closely follow those for the Forest College at Dehra. The chief conservator replaces the inspector general of forests as administrative officer, and is assisted by a board consisting of the director of public instruction, two conservators, and the director of the school, who occupies a position analogous to that of the president at Dehra Dun. The staff assisting the director are two instructors (usually one from the imperial and one from the provincial service), a verma-
cular instructor belonging to the provincial service, and an assistant vernacular instructor and curator, who is usually a ranger.

The courses of instruction last 23\(\frac{1}{2}\) months. The syllabus for the English course is the same as that for the rangers’ class at Dehra Dun, but excludes arithmetic. The vernacular course is similar but more elementary, and includes arithmetic. The system of examination and marking is as at Dehra Dun. Pass and honours certificates are awarded, the former to students who obtain over 50 per cent. of the total marks, including 50 per cent. of the marks allotted to each of the subjects—forestry, botany, surveying and engineering, and the latter to students obtaining over 75 per cent. of the total marks and 50 per cent. in each subject.

The number of students admitted yearly is decided by the amount of accommodation available. The maximum number that can be trained at one time is 60, 10 in the English and 20 in the vernacular course of each year. There are only two categories of student: (a) stipendiary students and (b) students already in government service. For upper (i.e., English) class students the rules of admission, both as regards age, educational qualification, and preliminary practical training, are similar in almost all respects to those for the corresponding categories of students taking the rangers’ course at Dehra Dun. Failing the production of a certificate of having passed the VIth standard examination, candidates for the lower class are required to pass a simple entrance examination.

As the Coimbatore College was not opened till the 1st July 1912, it is unnecessary to say more than that it provides instruction to candidates for Forest appointment as rangers, and that the course of instruction and the rules for College admission are almost identical with those at Dehra Dun. It has been established with the object of training the ranger staff for Southern India, thereby relieving the pressure on the parent institution.

Provincial schools and classes have now been established in almost all provinces with the object of improving the qualifications of the lower ranks of the subordinate establishment, i.e., deputy rangers, foresters and forest guards. The scope of the instruction given varies slightly, but is in the main practical. A statement of these schools and classes is given in appendix XXII. They are ten in number, and train rangers, deputy rangers and guards.

VII.—Veterinary science.

The great development which took place in the agricultural administration after 1905 was accompanied by a similar development in veterinary matters. The civil veterinary department, having been relieved of the greater part of the work connected with horses and mules in 1903, had become free to devote itself to a more purely agricultural sphere of duty, and it shared with the agricultural department in the developments initiated in 1905. The changes then effected were mainly in the direction of an increase of staff, the number recruited in this country rising from 408 in 1904 to some 911 officials in 1911-12. As the demand for veterinary education in India is almost entirely confined to candidates for the public service, the increased recruitment led to a largely increased demand for veterinary education. To meet this demand, the existing colleges were considerably reorganised and their equipment much improved. Information on this point up to 1907 was furnished in the last quinquennial review. Progress since 1907 has naturally been slower, but, as the details given below for each college show, the improvement both in organisation and equipment has continued.

The following are the institutions at present existing:

(1) Punjab Veterinary College, Lahore.
(2) Bombay Veterinary College, Parel, Bombay.
(3) Bengal Veterinary College, Belgachia, Calcutta.
(4) Madras Veterinary College, Vepery, Madras.
(5) Burma Veterinary School, Insein.
The number of veterinary graduates who passed out from the veterinary colleges during the quinquennium and the number of students who attended during 1911-12 together with corresponding figures for the previous quinquennium and for 1906-07 are given below:

<table>
<thead>
<tr>
<th>Province</th>
<th>Number of students attending during 1906-07</th>
<th>Number of students attending during 1911-12</th>
<th>Total number of graduates passed out during the years 1902—1907</th>
<th>Total number of graduates passed out during the years 1907—1912</th>
</tr>
</thead>
<tbody>
<tr>
<td>Punjab</td>
<td>259</td>
<td>196</td>
<td>209</td>
<td>334</td>
</tr>
<tr>
<td>Bombay</td>
<td>111</td>
<td>88</td>
<td>59</td>
<td>107</td>
</tr>
<tr>
<td>Bengal</td>
<td>164</td>
<td>123</td>
<td>65</td>
<td>154</td>
</tr>
<tr>
<td>Madras</td>
<td>410</td>
<td>51</td>
<td>39 in 2 years</td>
<td>76</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>564</strong></td>
<td><strong>458</strong></td>
<td><strong>362</strong></td>
<td><strong>661</strong></td>
</tr>
</tbody>
</table>

Whilst the number of graduates who have passed out from the colleges during the quinquennium has very greatly increased, there has been a considerable falling off in the number of students attending the colleges. More care has been exercised in selecting candidates for admission to the colleges and great difficulty has been experienced in obtaining students who possess the educational qualifications required. In spite of the great increase in the number of graduates the demand for qualified veterinary assistants, and for the higher grades of provincial officers, such as deputy superintendents and veterinary inspectors, continues to exceed the supply. There is not at present any institution corresponding to the agricultural institution at Pusa, where the highest class of veterinary instruction can be given, and until such instruction is provided it will be difficult to procure in India a class of men suited to fill the higher posts of the department. A beginning has, however, been made in making this higher class of instruction available, and post-graduate courses have, as stated above, been instituted at the Punjab, Bombay and Bengal veterinary colleges. The following table compares the existing strength of the subordinate veterinary staff in each province with the staff which has been sanctioned:

<table>
<thead>
<tr>
<th>Province</th>
<th>Existing staff</th>
<th>Sanctioned staff</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deputy Superintendents</td>
<td>Veterinary Inspectors</td>
</tr>
<tr>
<td>Madras</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Bombay (including Sind)</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Bengal</td>
<td>6</td>
<td>15</td>
</tr>
<tr>
<td>Bihar and Orissa</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Assam</td>
<td>15</td>
<td>140</td>
</tr>
<tr>
<td>United Provinces</td>
<td>10</td>
<td>90</td>
</tr>
<tr>
<td>Punjab</td>
<td>16</td>
<td>140</td>
</tr>
<tr>
<td>Central Provinces and Bazar</td>
<td>10</td>
<td>90</td>
</tr>
<tr>
<td>North-West Frontier Province</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Rajputana</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Baluchistan</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
<td><strong>80</strong></td>
</tr>
</tbody>
</table>

The Burma Veterinary School deals with a class of students outside the reach of the Indian colleges, and the Punjab Veterinary College with a large number of military students. The bulk of the instruction at the Punjab Veterinary College and the whole of that at the Burma Veterinary School is in the vernacular. In the other institutions, the reading is in English. The course in all the colleges extends over a period of three years and successful students obtain a diploma. None of the colleges is affiliated to a university, but they are all controlled by the Local Government concerned through the agency of the agricultural department. The professors at the various colleges are drawn from the civil veterinary department and are helped by trained Indian assistants. The whole staff is ordinarily engaged on teaching and demonstration, but each college is equipped with laboratories which are used.

*One laboratory assistant attached to the Insein School.
not only for demonstration, but also for purposes of diagnosis and research. The courses of instruction at the various institutions and particulars of the teaching staff employed are given below.

387. The Punjab college is still the largest of all the veterinary colleges. Punjab The average number of students attending the college during the quinquennium was 238 and the average number who graduated 65. The additions which were made to the buildings during the quinquennium consisted of six stalls and a post-mortem room erected in the segregation ward. As it was found that the classes had outgrown the capacity of the staff, two imperial officers have recently been added to the latter, a post-graduate professor and a professor of pathology and parasitology, in addition to four assistant professors and three demonstrators. The sphere of work of the research laboratory attached to the college has been largely extended.

388. During the quinquennium the new Bombay college building, one of the finest and best in India, was completed and occupied, as were also a hostel with accommodation for 76 students and quarters for Indian professors. The pharmacy was extended and the post-mortem room improved. A new cattle-operation shed was built and the dog ward reconstructed. The staff of the college was recently reorganised and an assistant professor added to it. Provision has been made for holding a post-graduate course. The library is reputed to be thoroughly up to date. The work at the patho-bacteriological laboratory has greatly increased and the laboratory has been fully used for diagnostic purposes and minor research. Microscopes have been purchased for the pathology and histology classes and many new specimens have been added to the collections at the museum. The average number of students who attended the college during the quinquennium was 194 and the average number who graduated 21.

389. At the beginning of the quinquennium a new hostel with quarters Bengal for accommodating 156 students was opened in Calcutta. A post-mortem room, hospital surgeon’s quarters, quarters for married and unmarried overseers have been provided, and the laboratory accommodation has been extended by the addition of a room for photo-micrography and a dark room. A private hospital for students and a football and cricket ground have also been added and the services of a trainer and gymnasium instructor have been provided. The work in the research laboratory has included the examination of and report on pathological specimens and blood slides, the preparation of a quantity of normal sterile horse serum, the bacteriological examination of samples of bone-meal and some work on the treatment of surra. A post-graduate course has been instituted at the college. The average number of students who attended the college during the quinquennium was 152 and the average number who graduated was 30.

390. The superintendent of the civil veterinary department, Madras, has been relieved of the charge of the college and a whole-time principal has been appointed to it. The result has been a steady improvement in the work of the college, facilitated by the smallness of the classes which enables the lecturers to devote more time and attention to them. Land adjoining the college has been acquired for a recreation ground and for building purposes. A bacteriological laboratory and pharmacy have been sanctioned, but the buildings have not yet been commenced. Valuable models and instruments have been added to the museum. There has been a large increase in the work of the hospital attached to the college. The college staff has undertaken the examination of the slides sent in by the superintendent, civil veterinary department, and his assistants, and the work has attained considerable proportion. The average number of students attending the college during the quinquennium was 67 and the average number who graduated was 15.

391. The Burma school has been transferred to Insein. A temporary laboratory has been put in working order and a large number of smears examined, chiefly of diseases suspected of being of a contagious nature. In view of possibility of the future expansion of the school, about nine acres of land have been acquired. A laboratory assistant has been added to the staff. The number of cases brought for treatment at the hospital continues to increase steadily. A school for the training of Shans to deal with
contagious diseases in the Shan States was opened in 1910 and is reported to be doing good work.

392. Particulars regarding the number of students and the expenditure in the different colleges during the quinquennium are given in appendix XXIII.
VICTORIA JUBILEE TECHNICAL INSTITUTE, WEAVING SHED, BOMBAY.
CHAPTER X.

TECHNICAL AND INDUSTRIAL EDUCATION.

I.—General.

393. While the institutions described in chapter IX are primarily intended to prepare students for employment under government or other public bodies (though they have also come to include industrial or semi-industrial departments), the institutions described in the present chapter are distinctly industrial—that is to say, they teach the scientific principles of industrial processes, the processes themselves or the manipulation of material involved in trades or crafts.

394. Twelve years ago it was observed that industrial schools in India were lacking in definiteness both of method and object, that there had been no clear differentiation between general and technical studies, that they were not organised upon any sustained policy, that they were insufficiently co-ordinated with local industries and trades and that the impression they had produced upon industrial education and development had been relatively small. Lord Curzon's government took active steps to remedy this state of affairs. In the first place, they constituted a committee immediately after the Simla conference of 1901, which held conferences with local authorities in the provinces. The main recommendation of that committee was the organisation of an apprentice system under which the master artisans would ply their trades on the school premises. This was not accepted by the Government of India, who, in a resolution dated the 4th of January 1904, proposed whole-time schools at industrial centres for those who had reached a certain standard of general education, and for the encouragement of local handicrafts half-time industrial primary schools the course in which should be designed with special reference to teaching accuracy of workmanship and familiarising the pupils with the best designs and processes applicable to their hereditary calling. Importance was also attached to the formation of an inspecting agency and the provision of scholarships. The needs of the time were noticed in the resolution of 1904 on Indian educational policy, and the matter was referred to Local Governments. In the meantime, the Government of India made a recurring assignment for technical education of Rs. 2,44,000.

395. The reference to Local Governments produced various schemes, a Provincial feature of which was the necessity of establishing schools of higher grade in addition to the fostering of trade-schools. The whole subject has recently engaged much attention on the part of the educated public and of government. There has been a series of industrial surveys conducted during the quinquennium—in Madras, in Bengal, in the United Provinces, in the Punjab, in Eastern Bengal and Assam and in the Central Provinces. There has also been a series of industrial conferences. In Madras, the Ootacamund conference of 1905 recommended the creation of a department of industries and the transfer to it of the supervision of technical and industrial education. This proposal has been sanctioned in part; but the pioneering of industries by government was not allowed; it was held that state funds might be expended upon familiarising the people with such improvements in the methods of production as modern science and the practice of European countries can suggest and that it should be left to private enterprise to demonstrate that these improvements can be adopted with commercial advantage. A committee has recently sat in Bombay to consider the question of co-ordination between the courses and standards of technical institutions. At the close of the quinquennium a committee in Bengal was considering the question (among others) of a technological institute for Calcutta. A conference for the United Provinces was held in 1907 at Naini Tal. It recommended the establishment of a technological institute, a school of design, two industrial
schools on the lines of that at Lucknow, an experimental weaving station and a carpentry school, the introduction of a practical character into general education and the appointment of a director of industrial inquiries, etc. Much of this programme has already been carried out, as will presently be seen. A committee constituted in the Punjab in 1911 considered that there was nothing radically defective in the course of study at the technical schools, but that the industrial teaching was often unintelligent owing to the employment of ill-paid artisans. It was suggested that the Mayo School of Art should specialise in the training of efficient craft teachers and that as an experimental measure schools should be started teaching particular industries by instructors trained in European methods without any attempt at general education. In 1909, a conference was held in Eastern Bengal and Assam; this also recommended the formation of a special department and the establishment of a central industrial institute at Dacca, with demonstration factories. A conference was held in Burma in 1909 among the members of which there was considerable divergence of opinion. The recommendations included the establishment of a technical school in connection with the Insein engineering school with smaller schools at various centres, the encouragement of missions and other agencies to start craft classes and the encouragement of technical and hand and eye training in vernacular schools.

396. The general policy was thus laid down in 1904. It has since been expanded by the demand for institutions of a higher type than the trade-school, and elaborated for each province into schemes in general conformity with the main lines. The progress of the last five years has been considerable and may be described under the heads of supervision, organisation and numbers. Finally, it will remain to point out defects and difficulties and describe the most recent steps adopted for their remedy.

(a) Supervision.

The question whether industrial education should be under the departments of public instruction, or transferred to departments of industry as they arise, or transferred only as concerns schools organised on a more or less commercial basis, is one which has not yet been fully decided. Different arrangements exist in different provinces. In Madras a department of industries was created in 1909-10, of which the director undertook the inspection of industrial schools. The creation of this department was vetoed by the Secretary of State, and inspection was retained in the hands of a superintendent of industrial education under the department of public instruction. (Since the quinquennium ended, the department of industries has been sanctioned, and part of its duties will be the supervision of industrial schools—by which are meant those in which attention is to be paid to commercial considerations during the period of training—while for technical schools the education department under the director of public instruction will continue to be responsible.) A professor of the College of Engineering at Poona is also inspector of technical and industrial schools in Bombay; and there is a special inspector of weaving schools; both are under the local department of education. A superintendent of industries in Bengal was appointed in 1910; he also is under the control of the director of public instruction and inspects industrial schools. Mr. de la Fosse says of the United Provinces:

"When recommending the appointment of a special officer for directing technical education, the Industrial Conference had proposed that he should be styled director of industrial inquiries and industrial education; that he should be independent of the educational department; and that he should have the same status and emoluments as the director of public instruction. The Secretary of State did not agree with the view that technical and industrial education should be thus divorced from general education, and in sanctioning the creation of the post he ordered that the designation of the new officer should be changed to that of inspector of technical and industrial institutions; that his proposed salary should be reduced; and that in regard to educational matters he should be subordinate to the director of public instruction. The actual designation of the post which the Local Government has adopted is that of director of industrial inquiries and inspector of industrial schools."

An officer was appointed in 1910. In his former capacity he deals with government direct; in the latter he is under the education department. There is a director of industries in the Punjab (who is also the director of
agriculture); but the inspection of industrial schools is entrusted to the staff of the school of art. In the Central Provinces also the director of agriculture undertakes the industrial branch, and here he supervises industrial schools. In Burma the ordinary inspecting staff appears to be the only agency.

398. The difficulty of classification of institutions of this nature is merely (b) Organisa-
a manifestation of practical difficulties that underlie the problem. To the (c) Figures.
two types of schools foreshadowed by the Government of India in 1904 there has come to be added the idea (if not the fulfilment) of high technological institutions. Thus we arrive at the three-fold classification—which distinguishes between (i) technological institutions intended to instruct in the principles of science as applied to industrial arts and to produce masters and managers of industries and scientific advisers; (ii) technical or intermediate schools for the training of foremen and others who require some knowledge of scientific principles and of machinery; (iii) trade or craft schools intended to train artisans to follow their calling with dexterity and intelligence.

399. The progress of the last five years is sufficiently indicated by the following figures for technical and industrial (exclusive of art and commercial) schools. The number of schools has risen from 147 to 242, the largest increases being in Madras, Bengal, the United Provinces and the Punjab. Pupils have increased from 6,820 to 12,064, and it is noteworthy that the present number is nearly four times that in 1897. Expenditure has risen from Rs. 5,91,095 to Rs. 11,72,947 a year; and the amount spent from public funds from Rs. 2,12,504 to Rs. 5,25,506.

As regards management, 173 schools are under private bodies. Of these, 141 are in receipt of aid. Mission bodies are prominent as managers of these institutions.

400. While progress is re-assuring, various difficulties have asserted Difficulties in education. themselves, some of them long recognised, some the product of new developments. Technological institutions are only now beginning to be established in India. Hitherto, students have been sent abroad with scholarships. It is not always easy to arrange suitable courses; practical training presents a difficulty; some manufacturers are naturally chary of admitting outsiders to an examination of processes. The employment of the scholars on return, while by no means discouraging, is not fully assured. In technical schools of the higher sort it is not always easy to secure pupils. In trade-schools, there is the danger that boys will be attracted who are not of the artisan class and have no intention of pursuing the craft taught; pupils frequently leave the school before they have completed the course or become efficient; and there is the difficulty (most observable in the case of weavers) of providing them with proper implements when they take up their own work. The Bengal administration report says, "Money and labour have been wasted in teaching boys trades which they will never practise. Pupils often leave the schools when they have learned merely enough of the trade to earn a living. Industrial schools have apparently worked no change for the better in the Indian carpenter; the Chinaman has still to be called in when any work out of the common is required."

401. These points have recently been considered. At the Allahabad conference of 1911 it was recommended that technical schools should specialise along lines converging on local industries, and industrial schools should be permanently directed towards such industries as exist in the locality (see paragraph 30 of the resolution). In 1911-12, Lieutenant-Colonel E. H. de V. Atkinson, R.E., principal of the Thomason College, and Mr. T. S. Dawson, principal of the Victoria Jubilee Technical Institute, were deputed to make an enquiry as to the means for bringing technical institutions into closer touch and more practical relations with the employers of labour in India. Their interviews with employers form a most interesting record. They came to the conclusion that there is practically no opening for high grade mechanical or electrical engineers whose education is mostly of a theoretical character, but that there is a very large opening for the employment in these branches of men who, after training in a properly equipped institute, are willing to gain their practical experience by apprenticeship on a living wage, work with their hands and observe factory hours and rules. They recommended a
similar scheme of training for textile industries, and a school of mines in the
Bengal coal-fields with subordinate classes for evening lectures. At the very
end of the quinquennium the Secretary of State for India appointed a
committee in England to enquire and report as to the facilities available for
Indian students for industrial and technological training in that country,
with special reference to the system of state technical scholarships tenable
abroad. The enquiries and findings of this committee belong to a period
subsequent to that covered by this review.

For the general improvement of technical education or for the
improvement of special institutions, the Government of India have, in the
past two years, allotted Rs. 17,84,300 non-recurring, and Rs. 2,00,000
recurring.

In the description which follows, the three-fold classification of
these schools is adopted. But it is to be remembered that the technical school
and even the engineering school or college generally contains its artisan
classes or similar means for simple trade instruction. In particular, it has
already been shown that at Sibpur and Roorkee the technical and industrial
aspect of education has been recently developed side by side with the profes­
sional. An account of schools of art and of commerce is also given.

II.—Technological institutions.

State technical scholarships.

At the beginning of the quinquennium there were no institutions of
this class in India, though instruction of an advanced type was given in
mechanical and electrical engineering at the professional colleges. In place
of such institutions, scholarships tenable abroad were offered to Indian
students in order that they might benefit by the facilities available in England
and elsewhere. During the quinquennium an institute has opened at Banga­
lore and another has been attempted and proposed in the United Provinces.
The present section describes these developments.

The system of state technical scholarships commenced in 1904.
Their object is to qualify the holders on returning to India to assist in pro­
moting the improvement of existing native industries and the development of
new industries, especially those which are or may be organised on a consider­
able scale and those in which Indian capital is or may be embarked. The sub­
jects are annually chosen by Local Governments in consultation with mercan­
tile opinion. Agriculture, law, medicine, forestry and veterinary science are
excluded from the scheme. Engineering, at first excluded, has now been
admitted; and recently a scholar was sent to study architecture. There is
no examination. Nominations are made by the Local Governments and the
final selections by the Government of India. Those are chosen who are
considered to fulfil certain conditions. The scholar is expected to have had
the best education available in the province in the industry he intends to
study, a practical interest in the subject and the intention of devoting himself
in India to the practice of what he has learned. The value of each scholar­
ship is £150 a year. The scholar also receives his travelling expenses and
his education fees. The tenure of the scholarship is two years, but the period
may be extended. Government does not guarantee the holder any employment
on his return. Ordinarily one scholarship is awarded to each province
annually, but more may be given, subject to a total limit of ten scholarships.
Up to the end of March 1912, sixty-six scholars have been sent (an average
of about nine a year). In order of popularity the subjects chosen are
textiles, mining and mining engineering, mechanical and electrical engineer­
ing, leather, metallurgy, soap-making and the chemistry of oils and fats,
sugar industry, alkali, pottery, and engineering and sanitary science. Thirty­
one scholars have already returned to India; two have obtained employment
abroad; the rest have not yet completed their studies. Of the thirty-one who
have returned, eighteen have obtained private industrial employment, seven
are in government posts connected with industries, one is similarly employed
in Mysore, one has joined the bar, one is dead, and there is no certain
information about the remaining three.

A society in Calcutta, called the Association for the Advancement
of Scientific and Industrial Education of Indians, has also raised funds, aided
by government, for sending scholars abroad. It appears that 80 students thus
sent have returned, of whom twenty-eight have found industrial employment,
nine have started work on their own account, nineteen have entered govern­
ment, municipal or state service or are engaged in teaching, and twenty-four
(most of whom had only recently returned) have not yet found employment.

407. The Indian Institute of Science at Bangalore was initiated by The Indian
Mr. J. N. Tata, a Parsi merchant; but the scheme did not take final shape till
after his death. The Tata family have given land in Bombay which brings
in Rs. 1,25,000 a year. The Government of India gives Rs. 87,000 a year.
The Mysore Government contributed a site and five lakhs towards the initial
expense, and the Government of India gave two and a half lakhs towards the
same. The institute opened in July 1911, and 17 students entered it that
year. It provides for research, the application of new processes and the
production of thoroughly trained managers. It possesses departments of
genereal, organic and applied chemistry and electrical technology and also
provides instruction in French and German to enable students to read techni­
cal journals. As the first batch of students entered within a year of the end
of the quinquennium it is too early to judge of its results. The Allahabad
conference recommended its development into a complete faculty of pure and
applied science.

408. The establishment of a technological institute for the United Pro­
vinces was one of the proposals of the Naini Tal conference. It was decided
that it should consist of two parts. Classes in mechanical and electrical
engineering were to be attached to the Thomason College. The department
was opened in 1909 and took the place of a previously existing technical class.
It was intended to attract a higher class of students, particularly those who
had business connections and were destined to be managers or employers of
labour. No candidates joined. A three-fold division was then made, the
highest department offering engineering and training in textiles, the second
and third being on a lower plane and intended for mechanics. The
engineering section has hitherto not drawn the right class of students. A
whole-time textile instructor was engaged and plant was provided. It was
found difficult to obtain any students with the necessary qualifications. The
instructor resigned. It is intended to render the class more attractive by
adding weaving, bleaching and dyeing. The first experiences, says Mr. de la
Fosse, have not been very encouraging, owing to the reluctance or inability
of the class which it was proposed to benefit to take advantage of the oppor­
tunities offered. The lower division or mechanical apprentice class (which
belongs rather to the category of technical schools) has been more successful.
The second branch was to be established at Cawnpore with the object of
encouraging research in applied chemistry with reference to important
industries in the province. The Secretary of State did not sanction the
scheme. A more modest scheme was accordingly formulated, intended to
give instruction in the chemical aspect of sugar, leather, acid and alkali
manufacture, dyeing, bleaching, printing, colouring and finishing of
manufactured goods and paper making. Hitherto a site has been secured
and buildings commenced.

409. The mechanical and electrical engineering sections of the various Other
professional colleges may be classed as technological. At Sibpur the class for technological
tinctorial chemistry (mentioned in paragraph 353) may also be so described, classes.
and possibly the mining section there opened.

III. Technical schools.

410. Technical schools are those which train a grade midway between the Technical
manager or master on the one hand and the artisan or craftsman on the other. schools in
The engineering colleges in their lower departments are calculated to produce men of this type in the mechanical and electrical branch. The special institutions either converge on distinctive local industries, or where these do not exist, are situated at centres where an education in various branches may be expected to bring employment.
411. With the removal of the chrome tanning department described in the last review, it may be said that, with the exception of the schools mentioned in paragraph 350, the institutions in Madras are mainly of the craft-school order. The presidency possesses cotton-mills, tanneries and railway workshops. But, says Sir A. Bourne, "industrial education appears so far to have had little relation to production on a large scale, as exemplified by such factories and workshops." The government technical examinations will be noticed in connection with industrial schools.

412. Among a number of schools in Bombay four are classed as technical schools. Two require special mention. The Victoria Jubilee Technical Institute, Bombay, has classes in mechanical and electrical engineering, textile manufacture and technical chemistry. It is a privately managed institution under a board and is considerably subsidised by government. Hostels for 200 students, a central electric power station and other works have recently been carried out, towards which government contributed a lakh of rupees, as well as a special recurring grant of Rs. 15,000 a year for increased staff. The courses have been recast, the main change being their extension from three to four years including six months' practice in an outside mill, factory or workshop under supervision. The textile department is reported to be making particularly good progress, and the students acquire themselves well at the City and Guilds of London Institute examinations. The Ranchhodlal Chotalal Technical Institute at Ahmedabad was under contemplation when the last review was written. It opened, as an aided institution, about two years ago; and the first batch of students has not yet been turned out.

413. In Bengal schools of this type are devoted largely to mining and weaving. Managers of mines are required by rules framed under the Indian Mines Act (VIII of 1901) to possess first or second grade certificates according to the output of the mine or the number of employees. In addition to examination, five and three years' practical experience in the mine is necessary for a student, respectively, of a second and of a first grade certificate. But these periods may be reduced by two years through attendance at a course in a recognised institution. In order to provide such institutions and facilities for a general training in mining subjects, the Government of Bengal (the province where the majority of the mines are situated) established in 1906 a course at the Sibpur college and mining classes in the coal districts.

At Sibpur the student has first to pass the sub-overseer examination. He then pursues a two years' course in geology applied to mining, mining engineering, coal and metal mining, and descriptive mineralogy. Six weeks' annual training is given in camp in the coal-fields. There were sixteen students in 1911-12. Seven of them were special students, i.e., men already employed in mining who are attracted to the college by liberal scholarships. Owing to the lack of education among these special students, it has been decided to abolish the scholarships.

The mining classes are held at four centres in the Jerriah and Raniganj fields. A local committee at each centre arranges for good attendance. The average attendances in 1911-12 were 29, 35, 30 and 40 at the four centres respectively. The lecturers are recruited from local mining managers. It is proposed to increase the number of centres to six or seven. The classes are controlled by a Mining Educational Advisory Board which includes inspectors of mines, managers and educationists.

The utility of the lectures is lessened by the want of knowledge of English among the audience.

The course at Sibpur is not regarded as a success. On the other hand, the classes in the coal-fields have given satisfaction. The authorities concerned with mines and the representatives of the mining interests are in favour of instruction on the spot, and it is generally thought that the system should be developed by the opening of a school of mines at Asansol in addition to night classes at various centres. (The Indian Mining Association would prefer to develop the existing night classes.) It will be remembered that a university graduate course in mining has been framed. The Bengal report says, "The general conclusion appears to be that provision should be made both for a central institution at Asansol and for a more efficient and more extended system of instruction, through evening classes in selected localities, than is given at present. It is moreover evident that the introduction of university instruction in mining engineering would be at least premature for the present, if not entirely inadvisable."

In 1909 the Serampore Weaving Institute was opened in Bengal. It has two classes. One is for youths who have been trained in a technical school or have passed the 'B' class or matriculation. They have a two year course in power and hand-loom weaving, drawing and designing, calculated to fit them for positions in manufacturing concerns. Of a total of 64 students, 35 are in this class. They are encouraged to take the City and Guilds of London Institute examination in cotton weaving and spinning. They have had considerable success in the examination and have no difficulty in finding suitable employment. The other is really a craft-class, where weavers of the neighbourhood are put through a six months' course in practical weaving and improved methods of preparing yarns for warps on the Indian system. The principal says of this class, "At the commencement of the institute much difficulty was experienced in getting the actual weavers to join, as, apart from their prejudices, they were under the impression
that they could learn nothing more than what they already knew. I am pleased to be able to state that in a little while they changed their minds, and were full of wonder when they saw how easily their cherished trade secrets could be analysed and worked out after a little instruction, even by youngsters. This difficulty has been overcome, and at present there is no trouble in getting bond fide weavers to fill the place of those who pass out. Another attraction is the simple course of dyeing that they are taught. Up to the present time they had to buy dyed yams at high prices, and the weavers tell me that the knowledge of dyeing they get is quite sufficient for them to earn a livelihood apart from weaving. Prior to the establishment of the Weaving Institute, Serampore, weavers limited themselves to the manufacture of dhootis with coloured borders, and with few exceptions flowered borders were considered family secrets handed down from father to son, and these border designs were limited; now they are able to produce any design working up to about 10 or 12 shafts from design papers. The drawing lessons they get are a great assistance in producing new and original designs. Twenty small scholarships are given, and account for nearly Rs. 7,000 out of the total annual cost of Rs. 27,000. A difficulty is the supply of looms to those who leave the school. There are also three outlying stations where instruction is given and a school at Sambalpur mainly for the Gonds.

A society in Calcutta started in 1907 an institution called the Bengal Technical Institute which was amalgamated in 1910 with the technical department of the Bengal National College. It has an engineering side, with a course similar to that taught at Sibpur, and a technological side which teaches ceramics, tanning, painting and varnishing, dyeing, bleaching, soap, candle, oil and perfume making, and the preparation of matches.

414. The technological department of the Thomason College in the United Provinces has already been mentioned; other institutions will be described under industrial schools.

415. In the Punjab a school called the Victoria Diamond Jubilee Hindu Technical Institute has been started at Lahore with the object of attracting Hindus, especially those of the higher castes, to take up industrial employment. It is managed by a board of governors and derives its income from grants, subscriptions, a small endowment and the sale of the outturn. "There are two departments," writes Mr. Godley, "senior and junior; the former trains students for mechanical engineering, and the latter for engine-driving. Special instruction is also given in carpentry, fitting, etc. At the close of the year there were 50 students, of whom 28 were in the senior and 21 in the junior class. A number of students obtained certificates under the Boiler Act, and the report contains a list of ex-students who are employed as engineers and drivers on salaries from Rs. 30 upwards. The total expenditure was Rs. 12,599, about one-third of which was met from grants. A foundry was added during the quinquennium. The efficiency of the institution is greatly hampered by want of funds, and the practical value of the training given under the present conditions has been questioned by experts."

Mr. Godley also makes the following observations:--

"The province is well equipped with professional institutions maintained by the State, while the industrial schools maintained by local bodies offer possibilities of development into craft schools under the guidance of the Mayo School of Industrial Art. Technical education in the restricted sense, i.e., the training of a mechanical engineer and specialised scientific training for particular trades, can hardly be said to exist as yet. Of all forms of education this is not only the most costly, but also the most uncertain in its results. It is perhaps not sufficiently realised that technical institutions of the kind referred to can only flourish in an industrial environment, where there are concomitant industries which can supply students with opportunities of practical experience and well-paid employment. To argue otherwise would seem to imply that a school of technology has as good a chance of success at Dublin or Galway as at Manchester. There is nothing in the industrial history of western countries to confirm the view which is not infrequently advanced that technical schools will propria mota create industries. The average student attending a school of technology aims at getting employment on good pay as the result of his training and if the capitalist employer is non-existent, or if, as commonly happens, he is disinclined to venture his money on school-taught theory which does not necessarily carry with it business capacity, the technical graduate is worse off than the product of an arts college. It may well be doubted, therefore, whether in the Punjab, where industrial concerns are comparatively small and few, and salaries are on a modest scale, the time has come for advocating an ambitious scheme of technical education. More hope seems to lie in the direction of improving crafts and small industries by the introduction of better methods and labour-saving appliances, through the agency of craft schools or otherwise."

416. Mention has been made of the school at Insein in Burma in the chapter on professional education.

417. Of the Central Provinces, Mr. Wright says, "During the quinquennium the Industrial School at Amraoti was converted into the Berar Victoria Memorial Technical Institute. The buildings and shops were erected by popular subscription. A government grant-in-aid is given for maintenance. On completion of a three years' course
in the institute followed by a year's work in a mill or factory students are eligible for the Boiler Act examination. Eleven scholarships were given during the five years for study of textile industry, tenable at the Victoria Jubilee Technical Institute, Bombay.

IV.—Industrial schools.

418. It is impossible to give an exhaustive account of all industrial schools. The following paragraphs attempt to give an idea of the general line adopted in each province. The schools may conveniently be divided into general schools (i.e., those that give instruction in a variety of subjects, generally wood and metal work, weaving, etc.), and weaving schools, those, that is, that devote themselves mainly to the hand-loom industry. In some provinces, such as Madras, there are also special arrangements made for study of telegraphy, and in others there are automobile classes.

419. Sir A. Bourne remarks that in Madras industries are carried on by people working with their families in their homes or in small groups in workshops; the industrial revolution has gone but a little way. There is considerable scope for craft classes in this presidency as is testified by their numbers and rapid increase. "The industrial schools have mostly been established by missionaries anxious to secure a livelihood for their orphans. They are therefore often on a small scale and many of them are schools of lace-making and needlework. The director of industries criticised them as forming an unorganised body and as being too little in touch with actual industries and pointed out that industrial efficiency demands besides craftsmanship the ability to use time and material with such economy as results in commercial profit the need for training necessary for this can only be obtained in an institution in which one part of the work is the actual production of goods at a profit." Among the crafts taught the most general is woodwork. The largest classes for this trade are those of the Madras Anjuman-Muffi-Ala-i-Islam, an institution for poor Muhammadans substantially aided by government. The other schools appear to be managed by mission bodies. Blacksmith's work is taught in about six schools of which the Madura Technical Institute (already mentioned) has the largest class. The number studying metal work has somewhat declined and it is said that the director's work seems to have taken its place. A feature of the most efficient industrial schools is the extent of their commercial side. Skilled artisans are employed and orders of some magnitude are executed. Though the total value of work turned out fell during the quinquennium, the amount realised from sale-proceeds of school manufactures rose. "This," says the director, " seems to show that the schools are becoming increasingly efficient from a commercial point of view and are more successfully studying their markets." Printing and book-binding are taught on a considerable scale in the Madras Government Press Technical School where general press work is also learnt. There are other schools which teach compositor's work. The number of these is said to have fallen. The government technical examinations have already been mentioned. They are of elementary, intermediate and advanced grades. The subjects are numerous and include as well as engineering, sanitary science, pharmacy, commerce, music, drawing, jeweller's work, printing, etc., wood, metal and leather work, textiles, glass, pottery, tailoring and cooking. Scholarships are given on the result of the examinations.

420. Including manual training classes, Bombay reports 63 schools of this class, some of which are managed by mission bodies. Those situated in the northern division are reported to have done particularly well. One of them, the Mahajan Home Industrial School at Surat, is a charitable institution attended by orphans belonging to the Kali-paraj community where girls are taught embroidery and boys carpet making. With such exceptions, however, the inspector of technical and industrial education considers the state of these institutions to be unsatisfactory. In an interesting monograph he attributes this to the following causes:

(1) Lack of co-ordination of technical and industrial education throughout the presidency. Managing bodies and superintendents of schools are left to themselves as regards organisation and management, except in so far as they follow whatever advice they may have received from the inspector of technical education during his annual visit. In some cases credible efforts are made to meet the needs of the locality in respect of this kind of education. In other cases managing bodies or superintendents, though perhaps energetic enough, have failed to produce results in accordance with the object of such schools, viz., to give boys training that will be of practical value in preparing them for industrial life. In many instances, however, teachers have no further aim than obtaining good inspection reports.

(2) The teaching is usually conducted in a dogmatic manner, without method and without interest. In other words, the teachers have no clear idea of their functions as teachers and are in consequence uninspiring.

(3) The majority of boys who enter an industrial school do so without any definite object in view, and in this state of mind they drift aimlessly through their school course.
Their goal during this time is in most cases no higher than that of passing an examination. They and probably also their parents and guardians make no effort to form a plan of life, to choose a trade and keep that end in view.

(4) There are a number of schools which do excellent work, but which cannot be said to have obtained real success, for this reason, viz., that the majority of these pupils on leaving school either would not or could not follow up the trade or occupation for which they had some kind of preparation at school. I have tried to obtain statistics to show the extent to which this state of matters exists. Only a very few schools were able to comply with my request for returns, but these show that a very small proportion of the total pupils who have passed through the schools obtain suitable employment subsequently.

(5) The attitude of local authorities towards industrial education has in the past been often one of apathy. In many cases, local authorities are interested enough, but are apt to rely on their own knowledge of the subject or on that of incompetent advisers. In local board schools, teaching appointments are filled up without consulting the opinion of the director of public instruction or the inspector of technical education.

(6) The personal relations between the superintendent and his managing board, and the various authorities and employers of labour in the locality, have a very strong bearing on the question of employment of industrial school pupils subsequent to their leaving school.

To remedy these defects he recommends the appointment of a full-time officer, the training of all teachers of technical and industrial subjects, selection in the admission of pupils, the enlistment of the sympathies of employers of labour and others in the interests of such education, the approval of the director on the advice of the officer in charge of this branch of instruction to all appointments and the raising of the pay of teachers and superintendents.

421. Bengal has certain technical schools mainly for engineering, as already mentioned, and others of a more industrial character. The best of these is considered to be the Baniadih school attached to the East Indian Railway colliery workshop maintained by the company for the sons of its employees with a grant from the district board. It teaches physics, chemistry and mechanics and also gives a training in carpentry and blacksmith's work. Moulding and lock making are taught at the Barnagore industrial home; carpentry and carpet weaving at the Kaurapakur industrial school managed by the London Missionary Society; carpentry, cane-work and weaving in the Wesleyan Mission school at Bilkua; carpentry, weaving, tailoring, shoe-making, cane-work and book-binding at three schools in Balasore, two of which are managed by the American Free Baptist Mission. Of the schools in Calcutta itself the most important is that managed by the Oxford Mission at Ballygunge. Mr. Cumming makes a general remark about some of the institutions: "As the schools are subsidised by the district board there is every temptation for pupils to join who only desire the general education, and I found at one school well dressed sons of banias who had no industrial ambitions at all." An interesting development is the adoption of the apprentice system for Europeans and Indians by the railway companies in the railway workshops at Jamalpur, Lillooah and Kharagpur, and at the workshops of Messrs. Burn & Co. In local board schools, teaching appointments are filled up without consulting the opinions of the director of public instruction or the inspector of technical education.

422. In the United Provinces the industrial conference recommended the improvement of the Lucknow industrial school and the establishment of similar schools at Cawnpore and Gorakhpur and subsequently elsewhere. The Lucknow school after passing through many stages has been thoroughly reorganised. The numbers have been reduced and it now contains only genuine industrial students. The staff has been strengthened and the equipment increased. A hostel has been added and stipends provided for relatives of artisans. A night class containing 96 students is attached to the school. A class for painting and polishing has recently been started and is attended solely by the relatives of painters. Of the two new schools proposed only that of Gorakhpur has been started. It opened in 1910 on lines similar to those of the Lucknow school. It has made a successful start, the ordinary classes have been well attended and the night school has 71 students. Another recommendation of the conference was the establishment of a school originally designated the school of design. This is called the School of Arts and Crafts and was opened at Lucknow in 1911. A good start has been made, a hostel has been provided. The subjects taught are ornamental work, wood carving and gilding, stone carving and sculpture, calico printing, stencilling, lithography, iron work, drawing, painting, designing and modelling. The institution is intended to "provide instruction in those branches of design and handicraft which bear on the more artistic trades and professions now provided, or which may be developed in the province." In addition to these larger schools there are eleven aided and seven unaided industrial institutions founded with the object of helping poor boys to earn a livelihood by joinery, smith work, printing, tailoring, shoe-making, gardening, etc. The director of industries considers they are attaining the greatest success when they are organised on the apprentice system under which a journeyman artisan works with not more than two or three boys to help him. He also says that there is not much demand among...
the artisan classes for tuition, but a growing demand among those not of the artisan classes for industrial tuition for their friends and relatives.

423. The most prosperous institution in the Punjab is the railway technical school at Lahore with 461 pupils. There are also eight industrial schools maintained by local bodies which follow a departmental curriculum which was revised in 1911. Literary subjects are taught in addition to carpentry, metal work and weaving. It is reported that 66 per cent. of the pupils belong to the artisan classes and that a record of after-careers shows that most of those who have received this education take to industrial work. Special grants have been offered to local bodies for the opening of craft schools or for adding industrial instruction to ordinary schools and the establishment of an industrial school in each district has been suggested. Industries are also taught in orphanages and elementary schools.

424. Only three industrial schools are reported in Burma; but incidentally the American Baptist Mission has introduced instruction in carpentry, boat building, brick work and gardening at several of its schools. And at the school for Karens at Toun goo, carpentry, printing and book-binding are taught.

425. In addition to the artisan classes attached to the Ahsanulla School of Engineering and to the technical schools, Eastern Bengal and Assam has eight small industrial schools at Mymensingh, Bogra, Shahazadpur (Purna district), Chittagon and Rampur-Boalia (Rajshahi), Malda, Shillong and Kohima. The subjects generally taught are black-smith’s work, carpentry and weaving. The school at Bogra was started in 1908 and is a government institution. Those at Shahazadpur and Chittagon are private institutions. The latter received aid and there were proposals for its provincialisation. This, however, was not carried out; and the school has practically ceased to exist. The school at Rampur-Boalia is for sericulture and is under the agricultural department; that at Malda is a weaving school under the district board. The schools at Shillong and Kohima, called after Sir Banjyde Fuller, who initiated the scheme, are for the training of Khasis and Nagas; stipends are given; and the latter school is said to be particularly successful. There is also a Williamson Endowment in Assam (called after a tea-planter who left a sum of money for the education of the Assamese), from the proceeds of which, subsidised by government, twenty-one boys are maintained on stipends at treaty workshops and in private concerns and are provided with tools on the completion of the course.

426. In the Central Provinces some of the mission bodies carry on industrial education mainly for the benefit of their famine orphans.

V.—Weaving.

427. In Madras the number of pupils learning various crafts grouped under textiles is considerable although those who are learning cotton weaving show a decline owing to closure of one of the schools.

428. In Bombay textile schools naturally take a prominent position. The Victoria Jubilee Technical Institute has now a hand-loom section in addition to power weaving. The inspector of weaving schools makes the following observations:—“Since I began the inspection of weaving classes, fair progress has been made in some of the schools in which weaving is taught. There are ten small industrial schools in which instruction is given in textile work. There is no common curriculum for the schools. Each one has its own course of work, this makes it rather difficult to observe the progress made from time to time. If a common course of work was arranged for all the schools it would be the means of creating a keen competition to obtain the best practical results, especially if prizes were offered for work done. Some of the schools are in localities in which there is very little weaving, whereas in some of the chief hand-loom weaving centres weaving is not taught in the local industrial schools. This arrangement is one cause of the training not being as effective as it would otherwise be. From an educational and commercial point of view, this method is not good for the expansion of the cotton trade of this country because the boys only obtain a training equal to that of the bazar weaver, even assuming that the best of the local weavers are engaged to give instruction. Such instruction to the rising generation of hand-loom weavers, whose depressed condition is mostly due to the low level of primitive methods, will not be the means of raising the standard of work to enable them to compete with the weavers of other countries. Such teaching is without interest and of no real advantage. There will never be any natural indigenous demand for them until there is a higher standard of instruction given. In one small school several members of the committee are against any improvement being introduced. Two years ago I sent a fly shuttle motion, and now owing to the opposition of these members the loom had to be sent back. The same loom was sent to another school and it gave every satisfaction. I have pointed this out to show that members of the committee, by their apathetic attitude, keep back improved methods of working. At the same time the school had three instructors; not one of the three knew how to work the simple motion, yet the motion was introduced in other countries 150 years ago for giving an increased production of cloth in a given time.
Such instructors will never be the means of developing the mental powers of the boys on modern lines and creating a natural demand for indigenous industrial schools."

429. Bengal, as well as the school at Serampore and the weaving stations which have already been mentioned, has textile classes at Kalimpong and among others a weaving school under the Dublin University Mission in the Hazaribagh district, a board school in the Palamau district and the Bihar weaving institute which is the only industrial school in the Patna division. The Darbhanga District Board entertains a peripatetic weaving instructor and a carpenter who go about to the more important centres for Muhammadan weavers. The carpenter repairs looms when required. This, says Mr. Prothero, is a useful system which might be conveniently imitated elsewhere.

430. Mention has already been made of the weaving classes at the Thomason College in the United Provinces. An important part of the Local Government's scheme of industrial development was the revival of the hand-loom cotton weaving industry through the popularisation of improved looms and methods of working. The establishment of a weaving station formed an item of the general scheme. The school has been situated at Benares and started work in 1911. "The class for which it caters," says the report, "is very poor, backward in education and suspicious of novelty." It has proved difficult to frame a satisfactory curriculum. Of the 10 students in the school at the end of the period only one belonged to the weaver class. It is proposed to organise a hire-purchase system to help weavers to buy improved looms.

There are also eight schools, the first and most important of which is the Hewett Weaving School at Barabanki. These schools were at first placed under the agricultural department, but were transferred in 1911 to the control of the department of public instruction. They are managed by local committees and aided by grants-in-aid from government, which aggregated Rs. 31,500 in 1911-12. It is estimated that 870 learners have been trained to the use of new looms and 451 of them bought looms. Stipends are given to pupils. Though the Hewett School has been successful, doubts are entertained in the report as to the work of the schools in general. Sometimes the pupils attracted are not members of the weaving class. So far as can be ascertained the use of the improved loom leads to over-production and it is consequently difficult to market the cloth. Though accurate figures as to after-employment are not available, it is noticed as significant that it was recently found necessary to ask mill-owners if they would give employment to past pupils. It appears to be questioned whether the hand-loom industry is capable of indefinite expansion as a home industry, or whether the tendency is towards the development of small weaving factories. The inspector suggests that possibly cooperation rather than cottage industries will prove the salvation of the weaver.

431. The Punjab has no organised system of weaving instruction, but efforts have been made to introduce improved looms and better methods. A weaving station has been established at Lahore and recently the Salvation Army opened a school at Ludhiana. The latter has proved only partially successful partly owing to the inability or unwillingness of the weavers to purchase the improved loom after instruction. The department of industries recently sold some of the Salvation Army looms on a system of payment by instalments and these are said to be working satisfactorily. Two of the board industrial schools teach weaving and a third school is to be opened.

432. In Burma weaving is taught at a girls' school managed by the Society for the Propagation of the Gospel at Shwebo and in 14 vernacular schools.

433. Weaving is taught in some of the industrial schools of Eastern Bengal which have already been mentioned. The only institution entirely devoted to this subject is the board school at Malda. The weaving class at the Kashi Kishore School at Mymensingh collapsed at the beginning of the period, but has been resuscitated*; nineteen stipends ranging from Rs. 5 to Rs. 10 have been created; and there are now 27 pupils. The class opened in the Bogra school proved a failure and was abolished.

VI.—Schools of art.

434. Some account must now be given of schools of art and commercial schools. The schools of art in India are largely industrial schools. The large schools under the management of government number four. The number of their pupils has not increased and now stands at 1,234. Their cost is Rs. 1,96,556, all of which save about Rs. 32,000 is met by government. On the fine arts side the most noticeable tendency in recent years has been the attempt to revive Indian ideals and designs. There are also a few private schools.

435. In 1905 a scheme was initiated for compiling a set of industrial art pattern books for India. These are being worked out in various provinces. The Bengal report makes mention of an important work which the Calcutta School of Art is undertaking for that production, namely, volumes for Daecca silver ware and Bengal ivory carving.

* It is understood it has again collapsed.
Art schools in different provinces.

436. In Madras, says Sir A. Bourne, the functions of the school of art as such had been rather thrown into the shade by its industrial activities during the previous quinquennium. "The staff and working of the school have been reorganised. It is now intended that it shall be concerned only with industrial art, the only concession to the claims of fine art that is made being the holding of a class for painting. There is other drawing instruction in the school, but it is made to subserve the needs of such crafts as engraving, wood-carving, weaving, and lacquer and jeweller's work. The aim is to develop the art industries of the presidency on Indian lines, and to avoid that westernising of ideals and methods which it is conceived results from putting Indians through a South Kensington drill in drawing and modelling. The old system of paid apprenticeship has been replaced by scholarships and as the smallness of the number of these originally sanctioned appeared to discourage attendance, it was increased. The superintendent considers the influence of the government committees and of the government institutions encourages his pupils from taking them. A good number do so, however, and a large proportion pass. He holds competitions among them in craftsmanship and with the help of his staff awards certificates of merit. Improvements have been made in the building and equipment of the school. The superintendent again occupies the house on the premises, the pupils all attend for a full day's work, the staff is properly reduced and the system is put on the lines of the Indian school where drawing, painting and modelling are taught and teachers are trained. It is added that 134 pupils of this school are learning wood engraving and that jeweller's work is also taught.

437. The Sir Jamsetji Jeejeebhoy School of Art in Bombay continues to be highly successful. It may be said to consist of three sections. (i) First, there is the school itself, where drawing, painting and modelling are taught and teachers are trained. It has 357 students. The principal says, "Many fine specimens of ancient paintings of the Persian, Moghul and Indian schools have been purchased and are exhibited in the school museum and the distinctive qualities of the eastern convention have been continuously brought to the notice of students of these classes. Nothing short of compulsion, however, will induce students to work in this style, and to apply such drastic measures would at first interrupt the painting school and of driving the students to classes outside the school where western methods and conventions are less intelligently taught by Indians who have studied in Europe." Excursions are taken to places which afford objects of interest for drawing, plans and elevation. A new development, from which the principal anticipates far-reaching results, is the extension of the architectural school. "In the year 1906, this school consisted of two draughtsmen's classes in charge of a non-professional teacher, the course of study being entirely an elementary one. At the present time the school is in charge of the consulting architect to government who is assisted by three professional lecturers and instructors and the course has been enlarged to one of four years, in which all subjects germane to the study of architecture are taught. A commencement has also been made in founding a museum of architectural casts, models and materials which is an indispensable part of the equipment of such a school. The presence of a professional staff of lecturers could only be obtained by holding the classes in the morning from 7-40 to 9-40, and these hours also suit the majority of the students who are engaged in architects' and engineers' offices during the daytime. Both with regard to the numbers of students attending the architectural school and the quality of the work done, the results obtained from the improved tuition and the extension of the course have been encouraging. The number of students has risen from 37 in 1906 to 140 in 1911, and the effect of the improved tuition has been already apparent in the higher class of draughtsmanship exhibited in the plans submitted by architects in the city, to the municipality and Bombay City Improvement Trust. In the art that appeals in different ways to the greatest number of persons distinct progress has been made and the foundation laid of greater progress in the future. (ii) The Reay Art Workshops, the utility of which was doubtful and which formed the subject of an enquiry in 1910, contain 171 pupils (of whom 79 receive stipends) studying wood-carving, engraving, iron work, carpentry, copper, brass, iron and gold work, and other subjects. (iii) The Sir George Clarke technical laboratories and studios were opened in 1910. The subject studied is pottery. "The department," says the principal, "is in charge of a skilled chemist who has a small staff working under him. An exhaustive survey of all the clays found throughout India suitable for the manufacture of pottery has been made, and specimens have been analysed. Standard bodies with their appropriate glazes have been discovered, and these have been worked up into articles of commercial value and artistic form and colours. A school of pottery is to be established and information on all points connected with the pottery industry is now available for the persons engaged in the trade. The ground has thus been cleared for the establishment of a pottery on modern lines in India."

438. In Bengal the Calcutta School of Art was reorganised in 1909 and divided into five departments—elementary, industrial, draughting, teaching, fine arts. A pupil first joins the elementary class, and, after working there for two years, undergoes a course of...
about three years in one or other of the higher departments. The industrial department has classes for lithography, wood-engraving, modelling and wood-carving. Of the other departments, that of fine arts requires special mention. "The process of denationalisation," says the report, "has been arrested. The policy of installing Indian art in the place of supremacy which it ought to occupy in an Indian art school, and of inspiring the minds of the students with a desire to follow Indian ideals, has been continued during the quinquennium under review." The art gallery has been combined with the artware court of the Indian Museum and contains some of the finest available Hindu and Muhammadan water colours. There are 250 students. The cost of the school in 1911-12 was Rs. 44,312, of which all (save about Rs. 4,000 from fees) is defrayed by government.

There are three private schools of art in Calcutta. In Mr. Cumming's industrial report it is stated that one of them (the Albert Temple of Science), while professing an Indian character, uses European casts, drawing books and designs.

439. The School of Arts and Crafts at Lucknow to some extent serves the purpose of an art school for the United Provinces and has already been mentioned in paragraph 422.

440. The institution in the Punjab is the Mayo school of Art, Lahore. It has four departments—for elementary industrial work and drawing, for advanced industrial work, for draughtsmen and for teachers. New workshops are in course of erection, and cotton-printing, enamelling and pottery are about to be added to the course. Towards the end of the quinquennium, the school was busy with work for the Imperial Durbar. The principal, Sardar Bahadur Bhai Ram Singh, designed models for the amphitheatre, royal pavilion and dais. There are 280 pupils.

441. It should be mentioned that the Bombay School of Art conducts drawing examinations, at which, in 1911, there were 9,357 candidates. The principal is not altogether satisfied with the result; and the resolution states that government have under consideration proposals for the reorganisation of the scheme and the appointment of an inspector of drawing. Other schools of art train teachers; the class at Calcutta has been adversely affected by the fact that the university no longer prescribes drawing as a subject for the matriculation. In Burma, where there is no school of art, a series of copies based on Burmese design has been prepared and is proving popular.

442. There is a school of music for Europeans in Madras and there are also two schools for Indian music. There are three schools in Bengal, two of which receive aid.

VII.—Commercial schools.

443. The subject of commercial education has recently attracted attention in India. The University of Bombay has instituted degrees in commerce. The University of Allahabad and the Punjab University have instituted a certificate in commerce. Furthermore there is a project for a commercial college of an advanced type in Bombay. The scheme has been sanctioned and the question is under consideration whether arrangements should be made at it for the organised study of economy and sociological problems. The existing schools, as stated in the resolution, did not attain a high standard of instruction and the training offered prepares for clerical duties rather than for the conduct of business itself. General commercial courses intended to take the place of the matriculation or higher examination are not popular, because the immediate benefit is not discernible. Institutions which give instruction in shorthand and typing in addition to or in the recognised courses have increased and are sought after because they lead to immediate and comparatively remunerative employment. The total number of schools has increased in the quinquennium from 12 to 28, the number of pupils from 584 to 1,543, and the expenditure from Rs. 25,343 to Rs. 82,278, of which government provides Rs. 28,344. Indigenous commercial institutions called mahajani schools teach the Indian system of accounts and reckoning. Some slight description will be found of them in paragraph 668.

444. The most important commercial school in Madras is that at Calicut, which has a fine building. It was utilised for turning out teachers for the commercial subjects under the school-leaving certificate scheme. A considerable number of the schools in this presidency are reported to teach only typewriting, an occupation the wages for which have risen.

445. Commercial education in Bombay is described as a plant of tardy growth. The most flourishing institutions appear to be the Commercial College, Bombay, the Commercial School, Sholapur, and Aiyar & Co.'s Business College, Bombay. Nothing is said of the course pursued. In a few high schools there are commercial classes.
The commercial classes in Bengal were transferred from the Presidency College in 1907 and became a separate institution under the name of the Government Commercial Institute. It offers a day course extending over two years and comprising modern English, commercial correspondence and precis-writing, commercial and mental arithmetic and geography, book-keeping, shorthand, typewriting, and commercial Bengali. Evening classes have been held in reporters' shorthand, political economy and mercantile law. The examinations are controlled by a board including representatives of the chambers of commerce. The report complains of the disposition of pupils to neglect all subjects for shorthand, typewriting and book-keeping, the difficulty of convincing employers that there is virtue in any of the subjects taught save the first two of these, the preference for university examinations, and the competition of private schools, which (says the principal) "are prepared to teach any one just as much or as little as he pleases, and that too at whatever time of the year it may be convenient to him, and at whatever hour of the day." It is needless to descant on the 'C' classes (a part of the 1901 scheme which also produced the 'B' classes) because in the last year only two candidates presented themselves. Apart from defects of the course it may be hazarded that the failure is attributable to the fact that, while the 'A' class leads to the university and the 'B' class to the technical school, the 'C' class could not be relied upon to lead anywhere. The 'C' classes have now been abolished. Seven private schools are chronicled, with 367 pupils.

In the United Provinces commercial teaching has been taken up at the mission colleges—St. John's at Agra, and the Reid Christian College at Lucknow, where, in addition to the usual subjects, general business methods are taught and, at the latter institution, an Urdu shorthand class and a normal department for teachers of commercial subjects in high schools have been opened. There is also, says the report, a young and aspiring business department at the Meerut College, which has recently been placed in charge of a European professor and is in receipt of aid. The institution of a commercial certificate by the university is said to have stimulated and focussed the work of these departments.

Commercial subjects are taught in the Punjab at aided continuation classes in Lahore, and in high schools. The former are managed by the Young Men's Christian Association and the Young Women's Christian Association, and a number of the students are said to have obtained posts on good salaries. In the latter, pupils are generally prepared for the university clerical and commercial examination (considered about equal to the matriculation) which attracts a small and diminishing number of candidates. The want of success which attended the opening of a considerable number of such classes in government schools points to the necessity for concentration. There is a clerical and commercial school at Amritsar with 61 pupils; the course prescribed for the university examination is followed.

On the failure of the 'C' classes in Eastern Bengal, six private institutions were opened. They are said to be more than self-supporting and to be doing good work.
ALLAHABAD TRAINING COLLEGE.
TRAINING OF TEACHERS.

CHAPTER XI.

TRAINING OF TEACHERS.

I.—General.

450. The extent of the problem presented by the training of teachers is apparent from general table IX. There are 18,581 high school teachers, of whom 5,435 are trained. There are 24,493 teachers in middle schools, both vernacular and anglo-vernacular, of whom 9,038 are trained. Teachers in primary schools number 171,359 and those who have been trained number 42,551. The percentage of trained teachers to the number employed is thus 29 for high schools, 37 for middle schools, and 25 for primary schools. The number of teachers who annually pass with success out of the training colleges and schools is 5,019. The total number of teachers employed is 214,683. If we allow a wastage of 5 per cent a year the number of teachers to be annually provided is 10,734. At the present rate not half the annual wastage can be replaced by trained men; and there is enormous lee-way to make up. The main retarding causes are the unpopularity of the educational service, which does not offer sufficiently attractive terms, the dislike of any special course of education which will delay entry into a profession, and a want of appreciation of the benefit of training. Another factor is the comparatively high cost of this form of instruction; on the average each student (male and female) under training costs government Rs. 140 a year—a fact which renders difficult the establishment of a due number of institutions. The problem is a difficult one. On its solution largely depends not merely the rescue of secondary education from the conditions which depress so many of the institutions, but also the lasting success of any scheme for a wider diffusion of elementary education. An expansion of training facilities, combined with better prospects for the educational employee, is the obvious remedy.

451. The features of the quinquennium have been the increased attention paid to this branch of education, the steady growth in the number of institutions and pupils, a much wider extension in some provinces of the facilities for primary training, and, most striking of all, the establishment of secondary training institutions where none existed before. It is remarkable that in Bengal and Eastern Bengal and Assam, where the number of high schools for boys is over half of that of the whole of India and the number of English middle schools actually 1,537 out of 2,484, no institutions previously existed for the training of the host of teachers required in these schools. The existing colleges and systems for training secondary teachers have been re-organised and improved, especially in the matter of staff. Finally, at the close of the quinquennium, large re-organisation schemes were under contemplation in Madras (which would throw the work of secondary training entirely on colleges and high schools) and in Eastern Bengal and Assam for a great expansion of the facilities for elementary training and the entertainment of a better staff. The schemes have been sanctioned subject to certain reservations in the case of Madras.

452. Training institutions naturally divide themselves into those for secondary and those for primary teachers. The quinquennium has seen a further move towards general uniformity of organisation—colleges preparing both graduates and under-graduates (sometimes separately, sometimes together) to be secondary teachers; normal schools and schools or classes of lower grade instructing primary teachers or candidates for such posts. Madras and Burma still provide secondary training in institutions not of the collegiate grade. These two provinces also present some peculiar features in the matter of primary training.

453. The total number of institutions for men has risen from 318 to 500, and that of students from 8,225 to 11,887. The total expenditure has
increased from Rs. 10,68,969 to Rs. 17,76,193;* that from provincial revenues
from Rs. 9,15,712 to Rs. 15,37,109. The cost per student (in the case of men)
has risen from Rs. 134 to Rs. 156 a year, and the cost to government from
Rs. 114 to Rs. 135. These institutions are mainly under government manage­
ment, all the colleges save one and 335 out of 490 schools being controlled by
the State. In the United Provinces 108 of the schools are under board
management, in Madras 18, and in the Punjab two;† this makes a total of 128
board schools. Two of those shown in the tables are under native states.
Twenty-four are aided institutions (of which 14 are situated in Madras) and
one is unaided. Of the students, 8,601 are Hindus. Muhammadans have
increased from 1,100 to 2,110.

454. Of training institutions in general, it may be said that the difficulty
ordinarily is (save in the case of normal schools of certain provinces) to
attract students to them, and to keep them to the career of a teacher after­
wards. Fees are not required save in special circumstances, e.g., in Madras
fees are charged from students who come from outside the presidency.
Teachers deputed for training receive the full pay+ of their substantive posts.
Private students (i.e., those who are not yet in employ) receive stipends—
from Rs. 15 to Rs. 50 a month in the case of graduates, from Rs. 12 upwards
in the case of under-graduates; pupils in normal schools generally receive
a very small stipend, pupils of lower vernacular institutions Rs. 6 to Rs. 10.
The difficulty of ensuring that the trained teacher practises his profession
is greater in the case of elementary than of secondary teachers. Nor, among
the former, are those already in employ at the time of training so likely to
adopt another career as are candidates who, not merely having received a
gratuitous education but actually having been paid to receive it, are tempted
to utilise that education for purposes more lucrative than a vocation where
the initial pay is often no more or but little more than the stipends they
had previously been drawing. The measures taken include insistence upon
agreements and the prospect of special terms after training. The former
practice is confined to certain provinces and was extended to students of
training schools in Eastern Bengal and Assam during the quinquennium.
As to the latter, it has been laid down in Bengal that the promotion of teachers
in government schools shall depend upon the attainment by them of a degree
or a diploma in teaching; and graduates entering the subordinate service must
give an undertaking to go through a course when required. Some provinces,
as for instance Bombay, are beginning to prescribe a higher rate of initial
pay for elementary teachers. Of this more will be said presently. But the
complaint comes from some quarters that sufficient is not done for the trained
teacher to recompense him for the time spent in training.

455. A characteristic of training courses of various standards in India is
that attendance is necessary at an institution specially designed for instruct­
ing in the courses and for superintending practice. The universities insist
on this; and the departmental diplomas (save under certain conditions in
Burma) require the previous prosecution of study in a school recognised for
this purpose. The fitness of the institution varies from the college staffed
with European specialists and Indian graduates to the guru-training school
of Bengal with an instructor on less than £15 a year or the ordinary vernacu­
lar middle schools deemed capable of receiving apprentices. But the fact
remains that the diploma of training requires attendance at a training
institution; and provision is ordinarily made for residence on the spot, for
physical exercises and for an ordered life that contributes in no small
degree to the value of the course.

456. Another feature common to all these institutions, of whatever grade,
is the practising or model school attached. The question of its correct use
constantly arises. There has been a tendency during the period to replace
practising schools, in which the students under training do a portion of the
teaching work, by model schools in which they attend lessons delivered by a
regular staff, make notes and occasionally themselves take part. Thus we
learn from the Madras report that the practising schools were often poorly

* Excluding the training colleges for women.
† These two are of a purely temporary nature.
‡ Sometimes up to certain limits; e.g., in the Punjab up to Rs. 40, above that three-quarters.
attended because the teaching was indifferent, the training staff had to devote too much time to improving it, and those under training were unable to pay sufficient attention to the improvement of their general education. These remarks may be taken as of general application to different grades of institutions though not of equally full application to all. Larger institutions, such as colleges, either have a special high school attached to them on the premises for this purpose, or use one or more already existing schools near by. Institutions of lower grade (such as the guru-training schools of the Bengals) ordinarily have an elementary school in the same building. Model elementary schools have been established in Madras with excellent results. Sometimes this system is combined with a limited period of regular teaching. At the Lucknow College for under-graduate teachers each student is required to take six weeks' teaching under normal conditions in one or other of the high schools that have offered themselves for this purpose. It is said that the greater stress and attention given to this side of the training has been thoroughly beneficial. There is a similar scheme in some of the vernacular normal schools of the Punjab. Thus, at Rawalpindi, the model school was run entirely by the pupil teachers for nine continuous weeks, each student working for five days; and at Multan every student taught in the model school for about three weeks on an average. The suggestion may be hazarded that (though practice cannot be dispensed with) the model lesson is suitable in the case of the secondary teacher, whose better education enables him to understand principles and imitate intelligently, and whose after-work will be carried out before a (potentially) well ordered and quiet class in a single room among surroundings favourable to the application of a theoretic and methodic grounding. The elementary teacher, on the other hand, must not only watch, but also, to a far larger extent than the graduate, practise the very activities in which he will subsequently engage. His mental calibre demands rules of thumb learned by actual application; his teaching will be done in the pell-mell of an elementary school, where several classes of different ages are probably seated in a one-room building and ready resort must be had to shifts and devices in order to overcome difficulties. In this connection, the inspector of Kumaon (United Provinces) writes:

"A novel feature, in the practical work of the training classes, has been introduced during the year to remedy a defect which has often been remarked in connection with the subsequent school work of teachers trained in these classes, i.e., their comparative inability to handle successfully more than one class at a time. To put three or four classes under one teacher may not be an ideal arrangement, but it is unfortunately inevitable in the great majority of lower primary schools, and it seemed only common sense to give teachers under training in the training classes an opportunity of acquiring facility in carrying on such work. Accordingly it has now been made the practice in this training class and in most of the other training classes of the division to set one pupil teacher to conduct several classes simultaneously, the others looking on and criticising, and when this is done once a week or so it is reported that good results are gradually attained."

457. The staffing of these institutions is of vital importance. By Staff of reason of the difficulties of classification, the subject may be conveniently treated here. (It is to be understood that when pay is specified it means monthly pay.)

Colleges which train graduates ordinarily have a principal and a vice-principal in the Indian educational service. Bombay and the Central Provinces are exceptions and have only one member of that service. The rest of the staff varies considerably from one province to another. As examples may be taken the college at Saidapet near Madras, which has nine assistants on pay ranging from Rs. 75 to Rs. 250, seven assistants on low pay, partly for the practising school, a drawing master, a drill master, a lady (happy thought) for the instruction of the infants in the school, and a large temporary staff; and the college at Dacca, which has three assistant professors in the provincial educational service (Rs. 200 rising to Rs. 700).

Colleges or English training schools for under-graduates naturally have a less expensive staff. The colleges of this nature at Patna and Lucknow have European principals with special pay rising in the one case to Rs. 700 and in the other to Rs. 500. And with these may be classed the large schools at Rajahmundry (Madras) and Rangoon. The former (which was
till recently a college) has a headmaster in the Indian educational service and a numerous staff on pay varying from Rs. 40 to Rs. 200.

But here a difficulty arises. For in Madras and Burma the training of English and of vernacular teachers is conducted in the same institutions. In addition to the two large schools just mentioned, there are other schools. These are staffed in Madras by headmasters on Rs. 40 to Rs. 60, two to four assistants and a gymnastic master, while the model schools attached have headmasters on Rs. 20 to Rs. 25 and four or less assistants. In Burma the headmasters of these schools range from Rs. 100 to Rs. 400, with four or more assistants on pay varying from Rs. 50 to Rs. 250, and in all cases a teacher of Sloyd.

In other provinces vernacular is mainly distinct from English training. The higher vernacular schools (i.e., training or normal schools) are staffed as follows. In Bombay (where they are designated colleges) the headmaster is ordinarily on Rs. 400, and is assisted by an ample staff on pay ranging from Rs. 30 to Rs. 200, inclusive always of teachers of gymnastics, and sometimes of manual training, drawing or music. In Bengal the headmasters ordinarily draw Rs. 200 and the staff from Rs. 50 to Rs. 60. The schools of the United Provinces have headmasters on pay ranging from Rs. 100 to Rs. 200, each assisted by four teachers on Rs. 40 to Rs. 100, and a drill master. In the Punjab each school has a headmaster on Rs. 120 up to Rs. 200, and five assistants (including a drawing master) on Rs. 45 ranging to Rs. 100. In Eastern Bengal the headmasters of training schools are in the provincial educational service (Rs. 200 rising to Rs. 700); in Assam they are on fixed pay of Rs. 60. In the Central Provinces the pay of headmasters is Rs. 100 ranging to Rs. 200, and each school has generally six assistants on pay ranging up to Rs. 80. The North-West Frontier Province has one school, of which the headmaster receives Rs. 120.

Lower vernacular training is carried on in most of the normal schools just mentioned, in ordinary middle schools and also, in the Bengals, in small institutions called guru-training schools. In these last there are three instructors on Rs. 18, Rs. 10, and Rs. 8, respectively, who, as well as teaching the students, look after the attached model schools.

558. In this connection it will be interesting to consider the average annual cost of a student in a training school for masters in each province. The figures are—Madras, Rs. 147; Bombay, Rs. 171; Bengal, Rs. 113; United Provinces, Rs. 126; Punjab, Rs. 154; Burma, Rs. 465; Eastern Bengal and Assam, Rs. 105; Central Provinces, Rs. 160; Coorg, Rs. 174; North-West Frontier Province, Rs. 289; the average figure for all India is Rs. 131. The differences are due to the character of the staff and to the numbers under training. In Bengal and Eastern Bengal and Assam the cost is particularly low because the figures for the cheaply run guru-training schools are included. The figure for Burma is high, because the school serves the purpose of an English teachers' college.

559. Training colleges generally have good habitations of their own. The college at Bombay, however, has no building and occupies two class rooms in the Elphinstone High School. It also lacks hostels and playing grounds. The David Hare Training College at Calcutta does not possess very satisfactory accommodation. The buildings of the numerous training schools vary considerably. The larger normal schools have generally good houses of their own. Where there are large numbers of lower institutions difficulty naturally arises. In the Bengals, where these schools are very numerous, the buildings, which were regarded as of a temporary nature, were deplorable at the beginning of the quinquennium. Type plans were prepared and a large amount of money has been expended. The grants which have been given for training institutions should permit of considerable improvement in this respect. The erection of hostels has been a satisfactory feature.

Classification.

460. The present chapter contains a description of institutions given in a general way and taken class by class. There has been to some extent, as remarked above, an approximation of systems in the various provinces. But

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*This statement needs to be qualified by the further statement that in Burma the anglo-vernacular and the vernacular departments, though often situated in the same building, have distinct staffs. In the former departments the pay of the headmasters ranges from Rs. 300 to Rs. 400, that of the assistants from Rs. 100 to Rs. 250; in the latter from Rs. 100 to Rs. 200 and from Rs. 50 to Rs. 100 respectively.
the different organisations still offer points of difference sufficient to make
generalisation no easy task. Accordingly, at the risk of some repetition,
a description of institutions province by province is added in appendix XXIV.

It is also to be remarked that different systems of classification to some
extent vitiate the figures found in the general tables, while the classing
together in returns of schools of varying types renders impossible a complete
numerical analysis.

II.—English training institutions.

461. Institutions for the training of teachers in English classes fall into Colleges and
two broad divisions—colleges and schools. The former prepare graduates for schools.
high school masterships. The latter prepare those who have passed the
intermediate or the matriculation (or its equivalent) or (as in Burma) merely
a standard of the secondary school course to be assistant teachers in high
schools, headmasters of English middle schools, etc. The classification,
however, is not precise. Sometimes a college teaches students of both these
grades; sometimes (as at Patna and Lucknow) it teaches those only of the
lower grade; and Burma has no college, but instructs its teachers of all grades
in schools. This difference of arrangement and nomenclature introduces
inevitable confusion into the tables; and Bombay, which calls even its
vernacular normal schools by the name of colleges, classes its English teachers'
college with these in the category of schools.

462. There are (exclusive of the class for Europeans at Sanawar) ten (i) Colleges.
colleges for the training of male teachers for secondary schools. In 1907 there
were six colleges. The college at Rajahmundry (Madras) which was always
regarded as a temporary expedient has been closed, or rather amalgamated
with that at Saidapet. On the other hand five new colleges have opened.
The number of old and the number of new institutions are thus equal. Those
which previously existed include the following:—The Teachers' College at
Saidapet, near Madras, is now the only college in that presidency. It is a
well-found and well staffed institution. The secondary teachers' training
college at Bombay is classed as a school. It was opened about the close of
the preceding period and is housed in the Elphinstone High School. The
third and fourth are the Training College at Allahabad and the Central
Training College at Lahore. The fifth is the Training College at Jubulpore
in the Central Provinces, which though in previous reports classed as a
college was raised to the collegiate grade during the present period. Of the
new colleges four are in the Bengals, namely, the David Hare College in
Calcutta and the Patna and Dacca Colleges; likewise the London Missionary
Society's Training College at Bhawanipur (the one aided college for male
secondary teachers). The fifth is the new college for under-graduates at
Lucknow. Owing to the omission of the Bombay College the precise number
of students cannot be shown; but (if we exclude 15 students at Sanawar)
the general table shows 507 students against 367 in 1907. Similarly, the
expenditure, which was just over two lakhs in 1907, is now Rs. 3,11,539,
nearly three lakhs of which is met from provincial revenues.

463. The colleges are mainly intended for the training of those who are
already teachers of government and other high schools and of those who
intend to become teachers. Stipends are paid to the latter, their pay (or
some portion of it) to the former. In Madras, the director sanctions the
stipend, which in the case of a teacher may not exceed the pay of his sub­
stantive post, or in the case of a candidate up to Rs. 50 a month.* The
ordinary number of collegiate stipends is 40, but the director may admit
a larger number of stipendiaries. There were 99 students in 1912. At
Bombay, the selection of stipendiaries by the college has been changed to
a system of deputation of teachers by the director—twenty-nine from govern­
ment and five from aided schools. At the David Hare College (Calcutta)
twenty or (including inspecting officers) twenty-four graduates form the
limit of the class. A certain number of places are reserved for private
students.† At the Patna College (which teaches the course for the licentiate)

* Ordinarily, stipends of Rs. 15 are given to those fresh from college or from private schools;
and these form the great majority.
† It is stated that in practice only government servants have been admitted.
admissions are limited to twelve a year; private candidates, previously admitted with stipends of Rs. 35 a year, are now enrolled only when government teachers are not available to fill the vacancies—a restriction which is regarded as a mistake by the principal. At Dacca the full pay is given to a teacher, and stipends of Rs. 20 and Rs. 15 to private students in the degree and licentiate classes respectively. There are at present 37 students in the college, of whom 25 are already in government service, six are teachers in private employ, and six are candidates. Seventeen are taking the B.T. and twenty the L.T. course.

The colleges in the United Provinces appear to admit only candidates. The Allahabad College offers 30 stipends, the value of which has recently been raised from Rs. 15 to Rs. 20. At Lucknow there are 45 stipends—24 for those who have passed the intermediate, and 24 for those who have passed the matriculation or its equivalent. At Lahore the allowance payable to teachers of government and board schools under training has been raised to the full amount of their pay, save in the case of those whose pay exceeds Rs. 40, when three-fourths are given. The amount of stipends for candidates is Rs. 18. The number of students in this college is large—229; but the institution contains lower secondary and also vernacular classes. At Jubbulpore the college admits teachers on three-fourths of their pay and candidates on stipends of Rs. 15.

464. All universities save that of Bombay have now instituted degrees or diplomas for those who intend to follow the profession of teaching. In the case of the universities at Madras, Lahore and Allahabad the course is purely a post-graduate one. The Calcutta University alone offers, in addition to a bachelorship of teaching for those who are already graduates in arts or science, a licentiate in teaching for those who have passed the intermediate. It follows that the university courses are pursued at all colleges for English teachers save at Bombay, at Lucknow (where the institution has been specially established for under-graduates), and in Burma where the examinations are under the control of the department and of the Educational Syndicate. At Lahore and at Jubbulpore (Central Provinces) both university and departmental courses are studied. In other words, the colleges sometimes follow only the university course, sometimes only a departmental course and sometimes both. Occasionally it is found desirable to give instruction in additional subjects other than those prescribed by the university in classes which are being prepared for the university examinations.

In Bengal the degree of bachelor of teaching may be taken at any period subsequent by more than a year to the passing of the bachelorship in arts or science. The licentiate in teaching is obtained at least two years after passing the intermediate in arts or science. The course for the B.T. includes the theory and practice of teaching in relation to mental and moral science, methods of teaching specific subjects and school management, the history of educational ideas and methods and a selected educational classic or classics. The examination on these subjects is by means of written papers; but it is also necessary for a candidate to have undergone either a course of practical training consisting of not less than fifty lessons for a period of six months at a training school or to have served as a teacher at a recognised school for one year previously to the examination; and a feature of the test is a practical examination in teaching by means of lessons delivered by the candidate to a class in certain selected subjects. The course for the licentiate is similar to that for the degree save that the history of educational ideas and methods is not prescribed and a selected course in modern English prose and poetry is added. At least two years must elapse after the passing of the intermediate for the licentiate to be obtained. The Madras University prescribes a course only for post-graduates. It is of a year's duration. The examination is a written test in the theory and practice of education (including the elements of physiology and psychology, reasoning, knowledge and language, planning of courses, correlation of studies, classification, examination and methods appropriate to certain subjects), history of education and practical training. The Punjab University offers a degree of bachelor of teaching to graduates in any faculty save the oriental who have undergone a course of training for one year. The course includes principles of education, methods of teaching, and a fuller study of the methods of instruction in selected subjects. Written papers are set upon these subjects and a practical examination is prescribed for practical skill in teaching. The University of Allahabad offers a diploma of licentiate of teaching to graduates in arts or science after a year's study. A written examination is conducted in the theory of teaching and every candidate is required to have passed through a practical course of physical training.
and also to give satisfactory evidence of his ability to teach and manage a class. He may also offer himself for a test of special fitness, for teaching one or more branches of the high school curriculum.

465. Where, as in Bombay, the university offers no degree or diploma in teaching, or where classes for students of lower qualifications are attached to colleges teaching the university courses, the departments of public instruction prescribe their own curricula and conduct their own examinations. An exception is the system in the Bengal, where the university prescribes for and examines graduates and under-graduates alike.

The college at Bombay admits both graduate and non-graduate teachers. The course is of one year and includes method, psychology and the history of education, as well as practical courses in which the staff are usually employed. The training college at Lucknow admits those who have passed the matriculation (or the school-leaving certificate) or the intermediate examination—the former to a two years' course and the latter to a course of one year. The examination is partly written and comprises papers on general knowledge of English (including composition and conversation), arithmetic and geometry, and on the theory and method of teaching. It is partly practical, the candidate conducting lessons before a board. The Punjab College in addition to the university course for graduates (and the vernacular course) offers two other courses for matriculants or for those who have passed the intermediate (provided that the latter have also studied for the B.A. for two years or have passed the junior certificate in the first division) leading up to examinations called respectively the junior and the senior anglo-vernacular certificate examinations. The course is now of two years in the case of matriculants, in other cases of one year. It includes ordinary instruction in English, mathematics and (for the senior class) science, intended to broaden the knowledge of the candidates; and also in school management, criticism lessons and gymnastics. The training college at Jubbulpore in the Central Provinces while adopting the licentiate course of the University of Allahabad has retained a lower course extending over two years. The course includes the principles, history and practice of education. Special subjects may be taken. The test is partly written and partly oral. Burma has no college and the arrangement for training anglo-vernacular teachers will be noticed below.

466. The method of teaching in the colleges is by lectures, essays, and Method model and criticism lessons in the attached high school. The training. marks are made by the principal of the David Hare College. The aim of the training courses is "to give the teacher an all-round preparation for his work, both from the theoretical and the practical points of view. On the one hand, he needs a knowledge of the subjects which he has to teach, an acquaintance with the nature of the pupil's mind and of the principles which underlie the teaching art, and some knowledge of the history of education in the past. On the other hand, he learns by actual practice in the school room to control and teach his class. The theoretical training has been imparted by means of lectures on the theory and practice of teaching in relation to mental and moral science, on the methods of teaching school subjects and of maintaining discipline, and on the history of education. Weekly essays on appropriate subjects have been written by the students, and the library as an aid in preparation has been at their disposal; also test papers are periodically set by members of the staff. As to the practical training, each student attends the demonstration lessons by the staff; each has to prepare and give under supervision lessons in the schools; and each has to watch and criticise lessons given by the other students of the college."

The course also includes teaching English by the direct method to a class of young boys knowing little or no English at the commencement of their teaching in the Hindu School, and the Training College students make themselves responsible for the subject throughout the year. "The results," says Mr. Griffith, "have been surprising, as the boys now follow any lesson of a simple character that is given in English." At the Lahore College there are daily lessons in the science of education and the art of teaching, specimen lessons delivered weekly by the masters of the practising school, practice in teaching and managing classes for two or three weeks during the session, and daily criticism lessons.

467. The annual cost of educating a student in a training college for Cost males and females is Rs. 348 in Madras, Rs. 1,098 in Bombay, Rs. 1,163 in training. the United Provinces, Rs. 722 in the United Provinces, Rs. 414 in the Punjab, Rs. 1,077 in Eastern Bengal and Assam, and Rs. 794 in the Central Provinces; the average
figure for all India is Rs. 587. The difference in cost depends not so much upon the remuneration and size of the staff in the various institutions, but rather upon the number of students admitted. Thus, the numbers of students at Saidapet and at Lahore are 99 and 229, respectively (and vernacular students are included in the latter college). The Hare, Dacca and Patna Colleges contain together only 63 students.

468. Secondary training institutions of the lower grade exist because there are not enough graduates to staff all English teaching schools. It is therefore necessary to train as teachers a certain number of undergraduates — those who have passed the matriculation or the intermediate. Figures of pupils cannot be given, since they are mixed in the returns with those in vernacular schools. Moreover, as will have been gathered from the preceding section, they are sometimes shown among the numbers at collegiate institutions.

Organisation.

469. The arrangements in different provinces fall into three classes. (i) Sometimes, as just stated, the college trains both graduates and undergraduates. This is the case in Bombay, in the Punjab, in Eastern Bengal and Assam and in the Central Provinces. A description has already been given of the college courses in those provinces, and nothing more need be said. (ii) In Bengal and the United Provinces the instruction is imparted in each case in a single institution designated a college, but separate from the college in which the post-graduate course is taken. At the Patna Training College in Bengal the course for the licentiate in teaching of the Calcutta University is taught. Allusion has already been made to the Lucknow College. (iii) Madras and Burma have a number of institutions for secondary training. Madras has eight such schools with 154 under-graduate pupils, who have generally had some experience in teaching and expect employment in the lower classes of secondary schools or as headmasters of elementary schools. The course is purely professional, is conducted in English and extends over a year. An important scheme of reorganisation is under consideration, which will prolong the course to two years, increase the general knowledge of the pupils and render the instruction more practical. In Burma (which has no college) both anglo-vernacular and vernacular certificates are obtained after study in the normal schools, which number eight and may or may not contain anglo-vernacular classes. The system has been changed during the quinquennium. Previously, a pupil had to have attained a certain standard in the ordinary school or university career before he could be admitted to either of the courses prescribed (and save in the highest grade) to have attained a higher standard as well as undergone training before he could earn either of the three certificates; now, while three kinds of certificates are still offered, a single course extending over two years suffices for the earning of the primary or middle school certificate, and also serves as the groundwork leading on to a third year of study and a high school certificate. A pass by the primary certificate now merely means that the candidate, while not failing completely, has failed to secure a middle certificate. Previously qualification for admission to the primary course was the fifth standard; now it is the seventh standard; and the minimum age has been raised from twelve to fifteen years. Previously, qualifications for a certificate of the two lower grades were (in addition to training) the seventh standard and the matriculation respectively; now special and harder literary tests have been substituted; and a whole-time training course at a normal school is prescribed. Previously, untrained candidates were allowed to appear at the professional tests (which are held by the educational syndicate); now only teachers may appear under certain conditions. It will be observed that there are no institutions for training secondary teachers in the North-West Frontier Province, teachers for that province are trained at Lahore.

Admission and stipends.

470. The pupils admitted to these institutions are generally matriculates or those who have passed the intermediate; in some cases, as in Burma, they need not have passed the matriculation. Of the supply and quality of pupils at Lucknow, Mr. de la Fosse says: — " Formerly there was some difficulty in securing candidates, but it no longer exists, and quite a number of applications for admission have annually to be rejected for want of room
For men who do not proceed to college education seems to hold out as good a career as any other profession or occupation. The quality of the material for training remains rather mediocre. Intermediate applicants are not forthcoming in sufficient quantity and there is a preponderance of men who have passed only in the third division. This meagreness of intellectual and educational equipment constitutes a serious drag on the efforts of their instructors. In view of the fact that the students are sometimes included in colleges, sometimes in schools, it is not possible to state the amounts of stipends with precision.

471. It is unnecessary to enlarge upon the courses and methods pursued. Courses and These have been sufficiently indicated in paragraph 465, which gives in Methods a brief the curricula followed in some of these institutions. Generally it may be said that attention is given to enlarging the knowledge of the student in addition to his professional preparation for the work of a teacher.

472. The problems and the tendencies which have manifested themselves (iii) General in the organisation and courses of secondary training institutions during the characteristics, quinquennium are summarised in the following paragraphs.

473. It is coming to be recognised that colleges should confine themselves Qualifications to the work of training graduates. Those who have not already taken a degree are not admitted to the colleges at Saidapet, Calcutta or Allahabad. Of the last named Mr. de la Fosse says, “The single training college (formerly) admitted both graduates and under-graduates, thus attempting the impossible task of training M. A.’s and entrance passed men together.” This led to the opening of the Lucknow College. On the other hand, it may be observed that the supply of graduates is insufficient to provide the number of assistant teachers now required in high schools or of headmasters of middle schools. And, where arrangements cannot be made, as in the Madras presidency, at Patna and at Lucknow for the training of under-graduates in one or more separate institutions, considerations of economy, etc., have hitherto kept the under-graduate classes under the same roof with those for graduates. The difficulty of this arrangement is mitigated where only those who have passed the intermediate are admitted. It is noticeable that in the Bengals (where the supply of men with higher qualifications is probably larger) the training of matriculates has not been attempted. In Burma, where the supply is limited, those are admitted who have not even matriculated.

474. Owing to the unpopularity of a two years' course the period of train- Length of ing has in some cases been reduced to one year. The report from the Punjab training, undoubtedly shows that the change has increased the numbers in the college at Lahore. It is also stated to have induced a number of young men of the right type to take up educational work and to undergo training. The principal of the college, while considering the class of students obtained in this arrangement to be excellent, admits that the effect of the change has yet to be estimated. The principal of the Dacca Training College, on the other hand, is convinced that the B.T. should be a two years' course. “The first year,” he says, “would be devoted to the content and special methods of teaching of school subjects. We find that some subjects, especially history and geography, have not been touched since the student was in class VII of the high school and even earlier, and the impression is that any one can teach them so long as he is a few hours in advance of his class, or even if he has the advantage of a book in his hand. While we try to remedy this as far as we can, we find the time-table far too crowded.” In 1908, the principal of the Bombay college recommended the extension of the course to two years.

On the other hand it is more generally recognised that the lower grade training should extend over two years, and the course for the junior anglovernacular certificate for matriculates has been extended in the Punjab to that period. A similar proposal has been made in Madras.

475. The Punjab University has relieved its course and at the same time rendered it more practical by substituting a fuller study of the methods of teaching for the lives of eminent teachers and the systems of instruction in foreign countries which were previously included.
Greater attention is paid to manual training (not merely as a subject which the student may hereafter be called upon to teach, but also as an education in itself), to observation and to skill in physical training. Of the Allahabad college it is remarked that a novel side of the training is the course in the manual workshop. Twenty-five men have passed this course, taken readily to the work and shown in not a few instances considerable aptitude. The principal writes that they have "learnt the difference between accuracy and vagueness, they know what perseverance means, and have gained, what most Indian teachers lack, a respect for work done with the hands." At the Lahore college a workshop for manual training has been erected and application has been made for the engagement of a skilled European instructor with the object of organising classes in educational handiwork on modern methods. All the schools in Burma have instructors in Sloyd.

**Supplementary subjects.**

476. At Dacca, while the university curriculum forms the basis of instruction it is supplemented by weekly excursions to places of interest, such as the government farm, the bacteriological laboratory and the museum of the medical school. Criticism lessons are given of which the subject matter is prepared by the students themselves from original observation of the things and processes dealt with. Black-board work is made a special feature and each student learns how to teach physical exercises.

**Specialisation.**

477. The importance of specialisation is beginning to be realised. "Thanks," says Mr. de la Fosse, "to the enlightened policy of the university candidates may offer themselves for special examination in particular subjects of high school education. Probably more and more attention will be paid to this aspect of the work as time goes on. Its great value is at present to emphasise a fact, which is often overlooked, that a course in the principles of teaching or even practice in teaching cannot help a teacher much unless he has knowledge and grasp of his subject." At Lahore, too, each student specialises in science, history, geography, mathematics or English literature by writing out full teaching notes of twelve connected lessons in his special subject. A class for the instruction of science masters in the methods of teaching is held for a month each year in the Victoria College of Science at Nagpur. A special class for training high school teachers in geography (a particularly ill-taught subject) has been opened at Dacca and is said to have done good work. In order to produce efficient maulsis who would combine a knowledge of English with Persian and Arabic, two years' courses were opened at the Dacca and Chittagong madrassas, but have not proved successful. At the same time, the bulk of the teaching is directed to the attainment of method applicable to all subjects indiscriminately. For the trained teacher when he joins his school is often placed in sole charge of the work of a class; such an arrangement is desirable in junior classes; in the higher standards a certain amount of specialisation is an advantage.

478. The reports speak highly of the work of trained teachers. The strength of the staff and the possibility of bestowing individual attention upon pupils in comparatively small classes render good results possible. The examiners of the Lucknow college say:—"Taking it on the whole the results of the practical examination this year are very encouraging. The training given has evidently been of a very practical and stimulating nature and the pupil teachers themselves are evidently quite conscious of the benefit they have derived from their course. They have at any rate learnt to handle their classes properly and have gained ideas as to what to aim at in their lessons and what to avoid. They have learnt how to prepare a lesson and how to use their black-board and how to make use of illustrations. They have seen a variety of methods employed and their ideas have been enlarged. They have gained confidence in themselves and have learnt to take pride and interest in their work." The influence of trained teachers upon the instruction of the institutions they subsequently join is beneficial. "The weakest point of the system," says the Bombay report, "may be described as the turning out of enthusiastic reformers impatient of ancient methods who are sent to schools where these modern ideas are regarded as heresies and these innovations viewed with dislike and distrust." It is desirable (says the principal of the Bombay college) that headmasters know more of the work of the
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institution—"it often happens that they require from men trained here—especially in English—the observation of conditions which make work on new lines unfruitful or impossible." The same report adds:

"In its endeavour to train and help the secondary teaching public of Bombay the college has failed—owing to the indifference and apathy of the said public. Hundreds of teachers—many of them in schools close to the college—could have attended (free and at convenient hours) six different courses in the most important branches of professional knowledge during the last three years of the quinquennium. In spite of full advertisement and cordial invitation the open lectures of the college were completely ignored by the untrained secondary teachers of Bombay. As the output increases and the scope of influence is widened, a tradition will spring up and the full influence of the training operations will be felt."

III.—Vernacular training institutions.

479. The training of vernacular teachers, like that of secondary teachers, Normal and may be regarded broadly as of two grades, (a) Normal schools train those who have passed the middle vernacular standard (if such are available) as assistant schools and vernacular teachers in secondary schools and as headmasters of upper primary schools. (b) Those who have passed the primary standard are trained as elementary or lower primary teachers in smaller schools, as apprentices in selected middle schools or in classes of lower grade attached to normal schools. Some provinces have arrangements for re-training vernacular teachers, or for giving short courses.

480. Madras has 45 training schools (including the eight previously mentioned as belonging to the secondary grade—since all schools have the classes below the grade after which they are named). The pupils number 2,398. Among these are both higher and lower elementary candidates. Bombay has five vernacular teachers' colleges, one training school managed by government, and one managed by the American mission. The course is of one, two or three years according as the pupil aspires to be held eligible for a rate of pay of Rs. 12, Rs. 15, or Rs. 20 to Rs. 25 a month. Exclusive of a school managed by the Baptist mission at Serampore which sends in no returns, there are eight such training schools in Bengal—seven managed by government and one by the Church Missionary Society. Pupils number about 450. Those are admitted who have passed the primary standard and the course is of three years. The schools were previously divided into those of the first and second grade according to their standard and efficiency. Only one government school and the school at Serampur are now classed as second grade. There are seven normal schools in the United Provinces. The number of pupils has been purposely reduced from 707 to 466, because the classes were too large for efficient instruction and because the lower number provides enough teachers in secondary and upper primary schools. There are five normal schools in the Punjab, with 415 pupils. The stipends have been raised to Rs. 8 and the course reduced to one year. The eight normal schools of Burma have already been mentioned in connection with their anglo-vernacular training classes. Including those classes, the total number of pupils is 329, the reduction being partly the result of the reorganisation presently to be described. Eastern Bengal and Assam has five training schools, two of which are in Assam. The number of pupils is 422. The course is of two years in the case of teachers, where it is one year. The normal schools in the Central Provinces have recently increased from four to six, the new ones being a divisional school at Khandwa and an Urdu normal school at Amraoti. The number of pupils is 364. An experiment is being made at two of the schools of a course reduced from two years to one year. The Peshawar normal school instructs teachers of the North-West Frontier Province in a one year's course. Though the number of stipends has been raised to 100, the number of pupils is 59—the middle standard being required for admission and the supply of those who can comply with this condition being limited. The establishment of the elementary teachers' service and the opening of new vernacular middle schools will, it is hoped, remedy this. The school has recently been housed in a charming building called the Mihman Khana. The illustration of this school is of peculiar interest. It shows the Pathans of the frontier tracts, who are destined to become teachers in remote
and insecure villages. In the centre are seated Sir George Roos-Keppel, the
Chief Commissioner, and Mr. Richey, the director of public instruction. On
the ground are seated the boys of the practising school.

481. Elementary teachers are trained in various forms of institutions. If
in employ, they sometimes receive the pay of their posts, sometimes a stipend
which varies from Rs. 5 to Rs. 10 a month; the latter is also the arrangement
for candidates. The training is imparted in the normal or training schools
described in the preceding paragraphs, and also in inferior institutions.
Mr. Orange described these latter as existing in Bengal, the United Provinces,
Eastern Bengal and Assam and the Central Provinces. To this list must
now be added Bombay. The special facilities offered may thus be divided
into three classes:—

(a) training in normal schools,
(b) training in special schools of lower grade,
(c) training in apprentice classes.

482. The first system is common to all provinces in that a youth, trained
at a normal school, may subsequently find himself teaching in a lower primary
school. Ordinarily, however, the ex-pupils of these institutions are employed
in middle or upper primary schools. The system is especially found in
Madras, Burma and Assam, where (save for a few moribund apprentice-classes
and small schools for hill-races in the last mentioned) the same institutions
train higher and lower elementary teachers and are especially adapted for
this purpose, and to a small extent in Eastern Bengal. It has also been
started in Bombay. Thus, the 45 training schools in Madras, which have
been already mentioned, contain lower as well as higher elementary classes—
the former for the reception of those who have passed only the fourth standard
and undergo a two years' course.

The normal schools of Burma admit students of lower grade, but no
longer those who have passed only the fourth standard. Even for the pri­
mary course the initial qualification now demanded is a pass by the sixth
vernacular standard. The reorganisation of which this reform is a part
has already been described. It may be mentioned that, in Eastern Bengal,
classes specially for elementary teachers have been added to the training
schools at Dacca and Chittagong. In Assam (as well as the other arrange­
ments presently to be described) the two divisional training schools at Jorhat
and Silchar contain special classes of sixty pupils, where lower primary
teachers and candidates are instructed. The former receive their full pay
from the boards, the latter stipends of Rs. 6. The teaching is separate from
that imparted to the higher pupils. The defect of the course is that it is
only of six months and so makes little impression. Part of the reorganisa­
tion scheme framed by the Government of Eastern Bengal and Assam was to
establish two large schools for lower teachers in this area, with a course of
one or two years according as the pupil has, or has not, been in previous
employ.

483. The system of special schools for elementary teachers exists mainly
in the two Bengals. The institutions are called guru-training schools and are
described in Mr. Orange's report. They were ill-housed—for the idea was
that they should be removed as soon as the training of any area was accom­
plished. They were ill-staffed—for economy forbade efficiency. They were
ill-attended—for the total number of stipends tenable in each was ten, the
stipends were inadequate, and the gurus were constantly absent attending to
their own schools lest these should be appropriated by others in their absence.
The typical school was a ramshackle building of mud or bamboo, containing
three instructors on Rs. 18, Rs. 10, and Rs. 8 respectively, with a handful of
unwilling students in one room (generally gurus of surrounding schools) and
an elementary school for practising purposes in the other. In both provinces
improvements have been made during the period, and further improvements
are contemplated. Better buildings have been erected. In Bengal type
plans were framed for schools and hostels; construction and repair have been
transferred from the education to the public works department; over seven
lakhs have already been expended. The number of stipends has been in­
creased to sixteen in each school. The number of schools has been increased
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to 201 (exclusive of three aided schools), and the erection of 100 temporary schools is contemplated. Pupils, inclusive of those in second grade vernacular training schools, number over 3,000. It has been suggested that the pay of the head instructor be raised to Rs. 40 a month. In Eastern Bengal new buildings and hostels have been erected. Expansion has been attempted, not as in Bengal by a large increase in the number of institutions, but by doubling (in most cases) the number of stipends tenable in each of the 39 schools. At the same time the course has been lengthened to two years save in the case of those who have passed the upper primary stage or have had at least two years' experience of active teaching, in which cases the course is for one year only. The insufficiency of the output has only been partially cured, the inefficiency of the staff remains. A scheme has been formulated and has received the sanction of the Secretary of State to staff a number of these schools with officers of the subordinate educational service and to place the vernacular teachers upon a reasonable average salary of Rs. 30, to enlarge each institution so as to hold 40 pupils, to raise the qualification required for the limitation of the course to one year to the middle vernacular certificate, and thus to provide for the simultaneous training of 1,600 students, of whom 500 are to be teachers from upper primary schools, 500 teachers from boards lower primary schools and 600 new candidates. The separate schools which exist in Assam are small institutions managed by government or by mission agencies and intended for the training of teachers belonging to hill-races. They are situated at Tura in the Garo hills, Jaiaw (close to Shillong) in the Khasi hills and at Kohima and Impur in the Naga hills. In Bombay towards the end of the quinquennium local normal classes were opened for the instruction of untrained teachers. Each class appears to be attended by seven teachers for a period of six months. The report does not describe the modus operandi though it is said that the experiment is in its infancy and no definite opinion as to its success can yet be given. There appear (though the figures seem to conflict with those in the general tables) to be 24 classes of this kind.

484. The apprentice system consists in the placing of candidates for (c) Training employ at selected vernacular middle schools where they can pursue their ordi-

inary studies and also obtain a certain amount of instruction in method and practical experience. They are to be found in the United Provinces, the Punjab, the Central Provinces and Assam. Opinions regarding the efficacy of this course differ considerably. Mr. Wright says that in the Central Pro-

vinces there is a consensus of opinion that they are useless as a means of obtaining trained teachers. They arose in response to the demand and were a cheap way of making up the deficiency. They are now being abolished. In Assam the system has always been regarded as a dead failure and has been in process of abolition during the quinquennium, the classes attached to the two training schools being intended to take its place. In the United Provinces on the other hand the system has proved so successful that it has been greatly developed in the last few years. In 1907 there were 45 such apprentice classes with 274 pupil teachers in them. In 1912 there were 109 classes with 649 pupils. Each school takes six pupils who receive small stipends of Rs. 3 a month. It is possible that the success of the scheme in this province is due to two features—first, the presence in each selected school of a special instructor trained in a normal school (his pay must be at least Rs. 12 which seems little enough), and secondly, the popularity of middle vernacular education in this province which has enabled the qualification for admission as a pupil teacher to be raised in practice from the upper primary to the middle certificate, all but 27 out of the 649 pupils being possessed of the latter qualification. Mr. de la Fosse looks forward to an extension of this system to facilitate the general extension of elementary education.

485. The courses in vernacular training schools differ radically from those (iii) General in secondary training schools. First, the instruction is given in the vernacular characteristics. —for the teacher will himself instruct a vernacular school. Secondly, as the Courses. previous education and intelligence of the pupils are altogether on a much lower level, the curriculum is simple. It largely aims at imparting the actual knowledge which will place the teacher on a somewhat higher level than the pupils of the highest class he will ordinarily be expected to teach.
It also concentrates on the very subjects and books he will have to handle. Hence, on its general side, the course in all provinces provides for further instruction in the vernacular language, arithmetic and simple geometry, history, geography, drawing and drill. In several provinces a good deal of attention is paid to black-board work and to simple manual training, and the students of many institutions produce good raised maps and globes, which they take back as a property to their own village-schools. According as the primary school curriculum demands, elementary science, agriculture (or rather nature study), land measurement, the village map, simple accounts, the keeping of land records, elementary hygiene and botany may be added. Some of the Madras schools teach music; schools in Burma teach Sloyd; occasionally an oriental classic is added; and Bengal has permitted English as a subject in its training schools. On the professional side there is the study of a simple work on school-management; still more important, there is the constant presence of the model school, which affords practice and demonstration. A monograph by Lala Tara Chand is added as appendix XXV.

486. Training in special subjects is hardly a desideratum for the vernacular teacher. There was previously in the Central Provinces an agricultural normal class attached to the agricultural college at Nagpur. It was intended for the teaching of village schoolmasters. It has been abolished, because it is recognised that the teaching of agriculture is beyond the scope of primary schools and that nature study though a suitable subject is something different from agriculture. Instructors in nature study are now attached to four of the normal schools in the Central Provinces, to all the schools in the Punjab and to several in Madras. In 1911 a scheme was approved for training elementary teachers in Eastern Bengal and Assam in the delivery of lessons in nature study. A specially qualified professor was to be attached to the Dacca training college and to instruct the teachers of guru-training schools, etc., who would in turn impart what they had learned to the elementary teachers under their charge. It is not reported whether the scheme has taken effect.

487. In some provinces steps are taken by means of conferences, etc., held by inspecting officers while on tour to effect a certain amount of training for untrained teachers or of re-training for those who may be expected to have forgotten the instructions imparted to them. Bombay reports that classes opened with this intention have been closed. The United Provinces' report devotes some space to a description of conferences to which teachers are summoned to centres for such instruction. The opinions upon their efficacy are varied, and it is suggested that the annual lessons upon method constantly delivered by the same officer may pall upon the learners.

488. The efficacy of the training given in these institutions must naturally vary with the qualifications of the instructors and the care which inspecting officers can bestow. Another very pertinent problem is that of ensuring that the trained teacher actually adopts teaching as his profession. In some provinces as already stated agreements are taken, but the most effective manner of avoiding this kind of wastage is the offer of reasonable prospects. In Bombay the revised code of 1910-11 has made trained teachers of the first and second year eligible for a starting salary of Rs. 12 and Rs. 15 respectively, and the maximum pay of a third year man has been put at Rs. 25. The local boards have found difficulty in paying these salaries and the output of third year trained teachers has actually had to be limited in consequence. Similar rules are being introduced elsewhere. Mr. Prothero makes the following interesting remarks on the products of guru-training schools in Bengal:—

There can be no doubt that the standard of teaching in the primary schools has improved by the introduction of trained gurus. The weak point of the scheme lies in the fact that a large percentage of the trained gurus who pass through the schools do not return to their primary schools to teach, but take up other employment. The money thus spent in their training is lost to government. In 1909-10, 1,325 gurus passed out from the schools with certificates of competence, but the number of trained gurus actually employed in schools of all classes only increased by 585. It is thus clear that 740 gurus in that year sought other employment than teaching. Similarly in 1910-11
and 1911-12, 1,232 and 953 gurus respectively obtained certificates of competence, but the increase of trained teachers in actual service amounted to 944 and 521. The result was that during these two years government lost the services of 288 and 432 gurus whom it took pains to train." He further remarks that passed gurus are said to be employed in some numbers as mukhtars' touts.

IV.—Special measures.

489. The method under which officers of the Indian educational service Furlough are permitted to study methods and developments in other countries was described in Mr. Orange’s review. Such study is taken during furlough, and advantages are offered for its encouragement. Between 1902 and 1907 eighteen officers had availed themselves of the opportunity thus given. Since then three officers have been placed on such duty.

490. In certain provinces it is now the habit to insist on a certain amount of training of assistant deputy inspectors undergoing training in certain special classes in the case of the subordinate inspecting staff. Thus we hear of the inspecting staff. Bombay; sub-inspectors are specially trained at the Hare College, Calcutta; and in Eastern Bengal and Assam an examination has been prescribed for inspecting officers in vernacular literature, the art of teaching, discipline and organisation and the departmental rules and orders. The examination appears to have defeated a considerable number of officers.

491. Teachers’ associations have been formed in Madras through the agency of inspecting officers. Their objective is the general improvement of teachers and the special study of the subjects of the curriculum which are comparatively novel, such as drawing, civics and nature study. It is not uncommon to find such associations in connection with training institutions; the Hare College in Calcutta is an instance in point. In Bombay there is a somewhat similar association (not all the members of which are teachers) for the discussion of current educational problems. The Punjab has headmasters’ associations, of which the report says:

"These associations were started in 1908 in the larger educational centres of the province. Membership is not restricted to headmasters, inspecting officers and others who are interested in education being also included. The objects of the associations are to afford scope for local expressions of opinion on educational questions, and to promote harmonious relations between the authorities of the local secondary schools. They are the inspectors' advisory councils, and they have put forward many useful suggestions which have been adopted subsequently by the department. Many such local conferences have been held throughout the province, and it may be safely asserted that they have done much to promote good feeling between schools and to stimulate interest in educational matters."