

Indian Institute of Science, Bangalore.

ALTHOUGH only 203 students have worked for various periods in the laboratories of the Indian Institute of Science at Bangalore since its opening in 1911, and although only 14 of these have been regarded by the council as suitable for the diploma of associateship, the history of the Institute is of special interest to students of educational methods. The conditions affecting the activities of the Institute depart, however, so widely from the normal that it is impossible at this stage in its history to be sure whether any, and what, changes in the administration of the Institute would have resulted in more visible success. Bangalore, the site selected for the Institute by the late Sir William Ramsay, is mainly a military cantonment. Its position as a centre, either of scientific education or of technical industries, is almost negligible. The Institute itself occupies isolated ground far enough from the town to cut it off largely even from the limited social amenities obtainable in an Indian cantonment station. Distances in India are of the continental order, and university graduates, being generally married in early life, hesitate naturally to leave the established university cities to undertake post-graduate training at a distant institute which has no traditions, no connexions, and no established market value. Moreover, the number of science graduates qualified in India to undertake research work has hitherto been very small.

The machinery of government originally designed for the Institute reproduced some of the ordinary features of established universities, including a large "court," composed of widely dispersed members who have never even met as a body. Even the relatively small council is handicapped by the distance of some of its members, and its meetings have thus been largely controlled by the resident professorial members. Influenced by desire for a special review of progress by an entirely independent expert body, the standing Committee of the Court in 1921 requested the Governor-General in Council to appoint a committee of inquiry, which met towards the end of the year under the chairmanship of Sir William Pope, professor of chemistry at Cambridge; and the report of the committee recently made available forms a valuable study of this artificially created institution.

Hitherto the work of the Institute has been limited to two groups, which are distinct from one another in nature and method of training. In the department of pure and applied chemistry, students have been engaged in research problems; there has been, however, no systematic course of training, either by lectures or laboratory work. In the department of electrical technology, on the other hand, students have undergone a more systematic training, with the view of qualifying as practical electrical engineers. There has been no department of physics to link the other two, and no department of mechanical engineering on which to base the training in electrical technology.

Up to 1918 the annual income of the Institute amounted to something less than 17,000*l.*, but recently, owing to the sale on advantageous terms of the investments left by the founder, the late Mr. J. N. Tata, the income now available is nearly doubled.

The committee, in accepting the conclusion that the Institute has not fulfilled the just expectations of its founder, wisely refuses to discuss the merits of the specific complaints made against its administration, and limits its report to the discussion of proposals for reform. In the first place, the committee, after briefly reviewing the standard of scientific training obtainable at Indian institutions of univer-

sity rank, considers it desirable to establish, by lectures and laboratory practice in the Institute itself, definite courses of instruction which will lead the ordinary science graduate from the stage at which he usually leaves the average university college to that which will qualify him for systematic research.

Having given an outline of the fundamental policy to be kept in view, the committee proceeds to discuss plans for the logical expansion of the departments already established, assuming this to be preferable to the immediate introduction of additional branches of science. The scheme outlined contemplates the institution of eight professorships in branches of pure and applied chemistry, and these are to be linked with the now isolated department of electrical technology by a chair in general physics. It is proposed also to establish two additional chairs, namely, one in applied mechanics and another in thermodynamics, for the purpose of rendering more effective the training in the department of electrical technology. For the time being this scheme goes as far as it is safe to project future developments; even this will require a larger income than is now in sight. Indeed, two new chairs will practically absorb the present annual surplus, and the committee thus recommends that the first two chairs established to supplement existing activities should be preferably in chemistry and in thermodynamics and heat engines.

To create in other parts of India an extended interest in the Institute, the committee recommends a reconstitution of its government machinery. To the court it is proposed to add representatives of any new benefactors that may appear, as well as representatives of all the "reformed" Governor provinces, except Assam.¹ The committee proposes also to introduce a representative of each of the new legislative councils, Assam not in this respect being specifically excepted. These changes, the committee hopes, will create a friendly interest in the Institute in other parts of India; but the tendency (always manifest, and now decidedly strengthened by the recently reformed constitution) of developing provincial institutions may neutralise to some extent the committee's expectations in this respect. The only alternative plan of dispensing with such large controlling bodies introduces, however, dangers of the kind that, according to some witnesses, have adversely affected the development of the Institute hitherto.

The council now proposed as the body responsible for the determination of matters of policy, for finance, and for the appointment of a staff, includes the executive head of the Institute, who is styled principal in preference to director, together with eleven other members, composed of five nominees of the Indian universities, two of the Tata family, two of the Mysore State, one of the Indian Legislative Assembly, and a scientific officer to represent the Government of India. An explanatory paragraph in the report assumes that by this scheme the central government will be represented by two nominees, but the nominee of the Indian Legislative Assembly would be in no sense a representative of the Government of India.

For purely academic business it is proposed to establish a board of studies, composed of the principal, the professors, and certain other members of the staff.

The committee recommends that the principal should be a scientific man of eminence, with proved administrative capacity. This obviously wise prescription has been observed in the recent appointment

¹ We understand that the Government of India proposes to add to the government machinery of the Institute a representative of Assam and another of the newly constituted University of Delhi.

of Dr. M. O. Forster, although apparently it has not been found possible to combine these two qualities with "considerable Indian experience," which the committee regards as "almost essential."

Among the many difficult questions which the committee has carefully considered are: (1) The claims of local administrations on the services of the professorial staff for special investigations outside the Institute. Admitting the occurrence of exceptionally urgent instances, the committee thinks that any tendency in this direction to take members of the staff away from their immediate duties inside the Institute should be resisted. (2) The investigation of special technical problems for outside persons. These, the committee thinks, might be permitted under suitable control at the expense of the applicants, so long as a fee be also charged and be wholly credited to the Institute funds, no part of the fees thus obtained being granted to the salaried members of the staff who may undertake the work. (3) The committee considers that the higher staff should not accept any private practice which involves work to be carried out in the Institute laboratories, although it might be permissible for a professor to undertake purely consulting practice, subject to the approval of the council and with specified limitations. (4) While a member of the staff should enjoy the copyright benefits of any book of which he is the author, the committee is less decided about his taking out patent rights for inventions arising out of work done at the Institute. Each specific case of the sort which arises should be dealt with by the council on its merits. (5) Technical investigations in the Institute which successfully lead to work on a factory scale

(when, naturally, commercial interests intervene) should be stopped at this stage. In the opinion of the committee, the work should then be transferred to a commercial firm, which might, if necessary, employ members of the staff in a purely consultative capacity. (6) The Institute should not undertake routine analyses and determinations; these should be left to the private enterprise of outside chemical firms.

The committee thinks that the necessary co-ordination of the work of the Institute with that of Indian universities will be in part effected by the university representatives on the council and by more efficient publication of information regarding the activities of the Institute itself. It is suggested that the Journal of the Institute should be expanded to be made of more general interest; that the local organisation of an Indian section of the Society of Chemical Industry should be undertaken; that the staff should be encouraged, by the grant of travelling expenses, to take part in the annual meetings of the Indian Science Congress; and that a report on the research programmes in progress at the Institute should be submitted annually to the Indian Board of Scientific Advice.

Because of the isolated location of the Institute, the committee recommends an improvement in the hostel accommodation, especially for the benefit of married students, and generally an increase in the facilities for games and other social amenities. To ensure that progress is effected on sound lines, it is recommended that the Governor-General in Council as visitor should institute, once in every quinquennium, a review of the operations of the Institute by a special committee of inquiry.

Psycho-Analysis and Education.

THE place of psycho-analysis in schools was the subject of a discussion at a joint meeting of Sections of Psychology and Education of the British Association meeting in Hull. The crowded meeting testified to the evident interest taken in the subject, and to the growing appreciation of the need in educational work of a closer co-operation between those who are responsible for the training of the young, and those who are making a scientific study of mind working and development.

It will be well at the outset to state that the term psycho-analysis was used by all speakers in the broad sense of mental exploration to discover, or at least trace, the mental history of the abnormal child, the cause of his mal-development, feeble intelligence, delinquency, or vicious conduct. In no case was the term used in the strict Freudian sense; in fact, Dr. Crichton Miller, one of the speakers, expressly stated that, in order to avoid any misconception arising from the use of a term that might imply exclusively the theory and technique laid down by Prof. Freud, he preferred to use the term analytical psychology.

Appearing first as a method of treating nervous disorders Dr. Miller said that analytical psychology has a wider function. Its real scope and value should be preventive, its application as universal as the accepted principles of hygiene, and its propaganda carried on by all who have a stake in the next generation. Hence its importance to teachers, and hence the necessity for teachers to understand and value it in their own experience.

The advent of analytical psychology marks a new era in education because it makes a new demand, that the teacher should know, not only his subject and his pupil, but himself. It follows that one of the chief functions of analytical psychology in education is not to enable the teacher to analyse his pupils—a

technical task for which he cannot usually have either the time or the training—but to help the teacher to recognise and remedy failures of character development in himself, the inherent childishness, the prejudice, and self-deception which are the chief obstacles to understanding children, and handling them wisely. If there are still teachers who maintain that analytical psychology is irrelevant to their work, Dr. Miller reminded them that their failures will come to be judged by analysts later who have to attempt the re-education of the adult who might have developed into a man, and instead developed into a neurotic.

Dr. C. W. Kimmins in opening the discussion presented the case from the schools point of view, and claimed that the time was singularly opportune for a clear statement by the experts of the possibilities, and limitations, of the part a well-qualified psychologist could take in the appraisal of intellectual values, and in helping to solve those complex problems presented by the abnormal child.

The improvement attending the use of intelligence tests in the selection of children for promotion over the method of marks gained by the usual examination method has already been demonstrated, and there is no doubt that in the greater freedom of the child, and the fuller scope it has of self-expression and self-development under the Montessori system, the Dalton plan, or any other similar form of school organisation, many of the so-called psycho-pathological cases would disappear. But the child that will not respond to normal methods of instruction or treatment will probably always exist. The boy who has no apparent mental or physical defect, is interested in out-of-door life and plays games but shows no interest in instruction, and is always at the bottom of the class, is an educational failure, and a case for the psychologist. A day-dreamer is another type.