

published about forty years ago, a country was pictured in which moral delinquency was treated with sympathy and condoleance, while bodily disease of all kinds was held to be a crime, and was punished by fine or imprisonment. I suppose it will take a good many generations to reach that condition of enlightenment, but the time cannot be far off when the propagation of infectious disease will in all civilised countries be abolished.

The habitability of the planet Mars has of late been a subject of much revived discussion. The possibility or probability of the existence of intelligent beings in other parts of the universe, long a subject of debate, is a question of profound interest, but whether communication with them from the earth can ever be established, who can tell?

But as to discovery in physical science, as already said, the horizon widens as we go on; but it seems not improbable that there is a limit set, though as yet very far off, by the capacity of the human intellect. Nature's ways used to be thought simple, but now we know that she is not only mysterious, but complex. However, there is every reason to expect that great strides are possible, even in the immediate future. The sort of problems which remain to be solved are represented by such questions as the following:—What is the cause and nature of gravitation and other sorts of attraction? What is the difference between positive and negative electricity, and what is the relation of electricity to matter? What is the nature of chemical affinity, and is it really electrical? What is the constitution of the elements, and is the transmutation of metals a dream or a physical possibility?

The penetration into final causes seems as we proceed to be further and further out of our reach. The problems of life and mind are, up to the present, inaccessible to man in his present state, and, notwithstanding the hopes and beliefs of some physiologists, it is safe to say that they will remain so for a long time to come, if not always.

And even in regard to common matter and the physical forces, all we know about them is derived from the perception of phenomena through the agency of our senses. Now the senses, sight, hearing, and the rest, have been evolved, not to provide the means of surveying nature, but for the protection and advantage of the body to which they belong. It is possible, therefore, that the human view of phenomena is only a partial and imperfect view; at any rate, the world which is open to the sense perception of a man must be very different from that which is perceived by many animals with their highly specialised senses, such as the scent of the dog, the sight of the carrier pigeon, and perhaps other senses for which we have no name.

"In its ultimate nature," said Herbert Spencer, "matter is as absolutely incomprehensible as Space and Time. Whatever supposition we frame leaves us nothing but a choice between opposite absurdities."

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The Vice-Chancellor has published to the Senate certain letters from the clerk to the Drapers' Company in which it is announced that the company is prepared to erect a physiological laboratory at Cambridge at a cost not exceeding 22,000*l.*, and to make a further grant of 1000*l.* for the equipment of it upon the following conditions:—(1) that the site be given by the University and approved by the company; (2) that the architect be appointed and the plans approved by the company; (3) that the University undertake adequately to maintain the laboratory when erected, and to provide the salaries of teachers and demonstrators. A Grace will be proposed at the next Congregation gratefully accepting the offer of the Worshipful Company of Drapers, and a syndicate will be appointed to discuss details with the company.

Mr. R. S. Goodchild has been reappointed assistant secretary to the Appointments Board for three years.

GLASGOW.—On Wednesday, October 26, the services of Prof. William Jack, who lately resigned the chair of mathematics in the University of Glasgow after a tenure of thirty years, were suitably recognised at an interesting

and largely attended ceremony in the Bute Hall. Sir Henry Craik, M.P. for the University, presented to the Vice-Chancellor, Sir Donald MacAlister, K.C.B., a fine portrait of the professor, painted by Sir James Guthrie, president of the Royal Scottish Academy, which had been subscribed for as a gift to the Court by a large number of colleagues, students, and friends in all parts of the world. In addition, a sum of 300*l.* was provided for the foundation of a William Jack prize, to be awarded at intervals of three or four years to the author of the best dissertation on a mathematical subject submitted during the period in question for the degree of Doctor of Science in the University. A present of plate bearing a commemorative inscription was made at the same time to Prof. Jack. The latter, in an interesting speech of reminiscence, recalled the notable teachers and students with whom he had been associated during the half-century of his connection with Glasgow. His successor, Prof. Gibson, explained the value of the new prize as a stimulus to post-graduate study and research. The Vice-Chancellor, on behalf of the Senate and Court, acknowledged its debt to Prof. Jack, not only for what he had done, and done well, but for what he had been—the trusted friend and guide as well as the instructor of his students, the loyal comrade and peacemaker among his fellow-workers.

MR. S. BRIERLEY, formerly head of the Textile School, Stroud, has been appointed head of the textile department of the Huddersfield Technical College.

DR. J. A. EWING, C.B., F.R.S., Director of Naval Education to the Admiralty, will distribute the prizes at the Merchant Venturers' Technical College, Bristol, on Thursday, December 15.

MR. J. G. STEWART, of Edinburgh, has been appointed by the Essex Education Committee principal of the County Laboratory at Chelmsford. One of the chief duties of the office is to teach scientific farming to the agriculturists of Essex and Herts.

It is announced in *Science* that Mr. J. D. Rockefeller has recently offered to give to Western Reserve University for further endowment of its medical department the sum of 50,000*l.*, provided 150,000*l.* additional is raised. Toward this 200,000*l.* fund Mr. H. M. Hanna, of Cleveland, has given 50,000*l.* The trustees of the University have indicated their intention to undertake to secure the 100,000*l.* needed to complete the fund. Yale University is to receive the residue of the estate of the late Mr. S. H. Lyman on the death of the testator's brother, with the exception of 5000*l.* The value of the bequest is not known, but the estate is said to be large.

IN NATURE of October 13 a letter appeared from Mr. E. G. Reiss, honorary secretary of the Apprenticeship and Skilled Employment Association, directing attention to the fact that a number of laboratory monitors in secondary schools, who, having reached the age of sixteen years, were no longer eligible for employment by the London County Council, wanted situations. Mr. Reiss writes to say that he has succeeded in placing in various suitable posts all the boys referred to, and points out that a number of girls who have been employed in a similar capacity also want suitable employment. As yet Mr. Reiss has been unable to discover posts for these girls, and would be glad of any suggestions as to openings for them. They are about seventeen years of age. The address of the association is 36 Denison House, 296 Vauxhall Bridge Road, London, S.W.

THE Yarrow Educational Fund of the Institution of Civil Engineers was established to afford assistance to young men who desire to become engineers, who have given proof of their capacity to profit by specialised education and training, but who lack sufficient means to obtain it. Grants varying between 50*l.* and 100*l.* per annum, for a period not exceeding three years, may be made in the discretion of the committee. Applicants for such grants must be of British birth, not more than twenty-one years of age, and must be prepared to qualify for attachment as students of the Institution of Civil Engineers. Several vacancies for scholarships under the fund will occur in March, 1911, and the council of the institution are prepared to receive and consider applications therefor.

Applications should be addressed to the secretary of the Institution of Civil Engineers, Great George Street, Westminster, S.W. Further particulars may be obtained on application to the secretary of the institution.

IN the technical schools of this country the library is usually a comparatively unimportant factor in the intellectual work done by the institution in question. This is perhaps partly due to the insistent and ever-growing claims of the laboratories and workshops for apparatus, plant, &c. As a result of this and other causes, the higher work of many technical institutions is seriously hampered by the inadequate provision of scientific and technical literature, works of reference, and the journals of the learned societies. Not only is there a deficiency in the supply of books and journals open to the student, but in some cases the libraries themselves are small, badly lit, noisy, and crowded. This militates against fostering those habits of study which are essential to the progress of the student, especially as in some cases the technical student is unable to secure a quiet working place in his or her own home. The magnificent new library at the Battersea Polytechnic, recently presented by the munificence of Mr. Edwin Tate, and opened on October 21 by the Archbishop of Canterbury, is excellently adapted for study and reading by those attending classes at the polytechnic. The library is 70 feet long and 30 feet wide, and is erected at the south-western corner of the polytechnic, and can be approached both from the main corridor and the present reading-room. At the western end of the library is a wide bay containing a beautiful stained-glass window. The book-cases project at right angles to the wall, forming bays to seat readers, and the gallery runs round three sides of the library. The total book accommodation is 18,000 volumes. The whole of the fittings and panelling are of oak, the floor being of teak. As the building stands close to the road there are double casements, the inner ones being filled with ornamental lead glazing. As regards lighting, there is a separate window to each bay. Speaking generally, the library is planned on lines similar to those on which all modern university libraries are being developed, the books, for instance, being accessible at once to all students. The cataloguing is by card. Efforts are being made to obtain funds in order to increase very largely the technical and scientific portions of the library. It may be mentioned that the library is of considerable use, not only to students of the polytechnic, but also to certain local firms. Some little time ago a circular was sent from the polytechnic to the local chemical firms inviting them to utilise, if they wished, the works of reference and technical journals in the library.

At the meeting of the Education Committee of the London County Council on October 26 the question of the senior scholarships awarded by the council was under discussion. It was eventually decided to increase the number of these scholarships in 1912. Just as it was necessary to increase the number of intermediate scholarships in 1910 when the first batch of junior scholars attained the age of sixteen, so it will be necessary to increase the number of senior scholarships in 1912 when the same candidates reach the age of eighteen. The number of senior scholarships available for competition at present is 50; in 1912 it will be 100. The standard required for the award of these senior county scholarships is, however, not to be lowered in any way. It is estimated that the annual cost of awarding 100 of these scholarships will be 20,000*l.* In the award of senior county scholarships the council has regard, in the first instance, to the past achievements of the candidates and to the reports of the teachers under whom they have worked and of other responsible persons acquainted with the candidates, and such reports must have reference to the character and qualifications of the applicants as well as their scholastic attainments. The scholarships consist of a maintenance grant not exceeding 90*l.* a year. This amount is in each case determined after consideration of the requirements and the financial circumstances of the candidate. Senior county scholarships are, as a rule, tenable for a length of time necessary for a student to take an honours degree in the subject selected, provided that this period is not more than four years. When the scholarship has been held for four years the council may, in a limited number of cases, continue the scholar-

ship for a fifth year if satisfied that there are exceptional circumstances which render such further continuance desirable. At present the income of the parents or guardians of a scholarship holder must not exceed 400*l.* a year. A proposal to abolish this limit was referred back to the higher education sub-committee for further consideration.

SOCIETIES AND ACADEMIES.

LONDON.

Institution of Mining and Metallurgy, October 19.—Mr. Edgar Taylor, president, in the chair.—A. J. **Bensusan**: Notes on passagem mine and works.—R. H. **Kendall**: Treatment of refractory low-grade gold ores at the Ouro Preto Gold Mine, Brazil. These two papers, which were discussed conjointly, both deal with the same mines from slightly different points of view, so that one may be taken as the complement of the other. The ore treated is composed of quartz, tourmaline, arsenical and iron pyrites, with some bismuth, and the method of high concentration had to be adopted in view of the difficulties and losses encountered with amalgamation in the presence of arsenical pyrites and bismuth. The ore from the mine passes through grizzlies and rock-breakers to two series of Californian stamps, eighty head in all, and thence over blankets. The material remaining on the blankets is piped to *passadores* for daily concentration, and the concentrate passes through a second *passador* and thence to *bateas*, whence the gold dust is recovered, and the tailings return to the *passador*, and thence with the first *passador* tailings to the concentrates cyanide plant. The pulp from the mortar boxes passes over Frue vanners, whence the rich concentrates pass to the cyanide plant, and the tailings pass through spitzkasten and thence through the sands and slimes cyanide plants respectively. The papers describe the various processes and the plant in considerable detail, and give statistics as to costs, time of operations, and results.—J. Egerton **Wood**: A method of collecting gold from pannings. A short note dealing with a simple means of collecting and preserving gold values obtained in the field until such time as they can be cupelled in the laboratory.

PARIS.

Academy of Sciences, October 24.—M. Émile Picard in the chair.—A. **Haller**: Two active alcohols and a third ketone contained in spirit from cocoanut oil. The raw material used in the investigation was a bye-product in the purification of cocoanut oil. Apart from acids separated by alkalis, possibly arising from saponification of fatty bodies, methyl-heptyl-ketone, methyl-nonyl-ketone, and methyl-undecyl-ketone were isolated, as well as methyl-heptyl-carbinol and methyl-nonyl-carbinol. The two alcohols were dextrorotatory, the optical inverse of the alcohols isolated from oil of rue.—M. **d'Arsonval**: The second International Congress for the Suppression of Adulteration.—Henri **Douville**: How species have varied. As the result of a comparative study of the Lamellibranchs, the author is of opinion that the evolutionary changes have not been continuous, but have occurred in a series of abrupt steps separated by periods of stability.—MM. **Landouzy** and L. **Loederich**: Experimental study of heredity in tuberculosis. The experiments were made on guinea-pigs, dogs, and rabbits, and evidence was obtained of direct placental infection. In the cases where there was no direct infection the mortality was very high from causes other than tuberculosis.—F. **Robin**: The variation of resistance of steels to crushing as a function of the temperature. Relations between the static and dynamic properties of the steels. Data are given for copper, nickel steel, manganese steel, and three steels containing 0.07, 0.384, and 1.8 per cent. of carbon at temperatures ranging between -185° and 1400° C.—Edouard **Salles**: The diffusion of gaseous ions. Experiments were carried out with air, carbon dioxide, nitrogen, and oxygen; measurements were carried out with air at two pressures, 758 mm. and 1028 mm., and with nitrogen at four, 760 mm., 1000 mm., 1120 mm., and 1302 mm.—J. **Duclaux**: Refrigerating mixtures. A lowering of temperature is produced when carbon bisulphide is mixed with acetone. A simple apparatus is described, utilising the regenerative