meteorological services were asked to furnish data of the heights and flow of rivers and lakes whenever possible.

M. Teisserenc de Bort reported from the commission on the atlas of clouds, and gave particulars of certain alterations in the plates in that atlas and in the definition of stratus cloud.

M. Teisserenc de Bort and Dr. Rotch gave an account of an expedition through the regions of the trade wind and equatorial calms in the North Atlantic. M. de Bort gave the history of the expedition and the results of the observations obtained by means of captive balloons, and Dr. Rotch gave those obtained by kites. Prof. Hergesell followed with the results similarly obtained in the Mediterranean on board the yacht belonging to the Prince of Monaco.

Dr. Köppen announced that the German hydrographical expedition to the Bismarck Archipelago would similarly use balloons and kites during the voyage.

Prof. Mohn reported from the commission on meteorological telegraphy.

M. Polis directed attention to the fact that the *Daily Telegraph* already announces the coming of storms from the Atlantic, using observations sent by means of wireless telegraphy from ships at sea. The conference then passed the following resolution:—"This conference is convinced that wireless telegraphy is chosen to render in the future great service in the forecasting of the weather in the Atlantic, but before introducing it into the current service of the meteorological institutions it is indispensable to take satisfactory precautions for the control of the observations transmitted. The conference asks the Meteorological Office in London to prepare as quickly as possible a report on this question, and communicate with the other meteorological institutions that may be specially interested in the matter."

During this meeting it was announced that M. Mascart had been elected president, and Prof. Hildebrandsson secretary, to the committee, and that the following commissions had been renewed:—Magnetic commission, president, General Rykatcheff (St. Petersburg); aëronautical commission, president, Prof. Hergesell (Strasburg); solar commission, president, Sir Norman Lockyer (London); commission on radiation, president, Prof. Ångström (Upsala). After thanking the reporters of the various commissions for their reports, the president declared the session at Innsbruck to be at an end.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

OXFORD.—The Vice-Chancellor has appointed Lord Curzon of Kedleston to be Romanes lecturer for 1906.

The following elections have been made to the University mathematical scholarships:—to the senior scholarship, A. Holden (Balliol College); to the junior scholarship, A. V. Billen (University College); to the exhibition, J. Hodgkinson (Jesus College).

G. E. Beaumont (Magdalen College School) has been elected to a natural science scholarship at University College.

Scholarship examinations in natural science will take place on March 13 at Keble College, and on April 24 at Merton College, New College, and Corpus Christi College.

CAMBRIDGE.—The board of biology and geology has reported to the Senate on the disposition of its share of the Gordon Wigan fund, which amounts to about 150*l.* The following assignment has been made for 1905 and following years:—(*a*) A grant of 50*l.* a year to Dr. D. Sharp, for a period of five years (1905–9), or such part of it during which he holds the curatorship in zoology; (*b*) a grant of 50*l.* out of the income for 1905 to Prof. Hughes, to enable Mr. E. A. Arber to continue his researches into the stratigraphical and geographical distribution of fossil plants; (*c*) the balance of the fund for 1905, and a grant of 50*l.* for each of the years 1906 and 1907, to Mr. A. C. Seward, to enable the botanic garden syndicate to offer greater facilities for plant-breeding experiments. The same board strongly recommends that the agreement between the University and Dr. Dohrn, director of the zoological station at Naples, be renewed for a further period of five years, by the payment to him of 100*l.* per annum out of the Worts travelling bachelors' fund, such period to date from Michaelmas, 1906.

Mr. D. G. Hogarth will lecture on "Geographical Conditions affecting Population in the East Mediterranean Lands" in the Sedgwick Museum on Tuesday, February 20, for the board of geographical studies, and Dr. Hans Gadow is to lecture to-day before the Antiquarian Society on "Aztec Civilisation and its Origin."

THE council of the University of Liverpool at a meeting held on January 23 passed the following resolution:—"That on the recommendation of the Senate a readership in ethnography be instituted in recognition of the scholarship of H. O. Forbes, LL.D., director of the Public Museums of Liverpool, and that Dr. Forbes be appointed to the said readership."

IT is announced in *Science* that Mr. N. W. Harris, of Chicago, has presented 500*l.* to North-western University, to be used as an endowment for an annual series of lectures to be delivered by some distinguished man, not a professor of the university, upon the results of his own investigations in scientific, literary, economical, or theological problems. From the same source we learn that by the will of Andrew J. Dotger, of South Orange, N.J., the Tuskegee Normal and Industrial Institute will, at the death of the testator's wife, receive the residuary estate, said to be about 100,000*l.*

IN an address delivered to the Manchester section of the Society of Chemical Industry, Dr. G. H. Bailey, as chairman of the section, dealt with the question of higher education and chemical industry, pleading for more cooperation between manufacturers and teachers. If success is to be achieved in the chemical industries of this country, Dr. Bailey considers that there must be a great change in the curriculum hitherto adopted in our universities and colleges; moreover, "a satisfactory curriculum can only be assured by a more intimate association of the teaching authorities, whoever they may be, and the leaders of industry." In considering the present state of English industry and the methods necessary to ensure its prosperity, Dr. Bailey remarks:—"progress in manufacture must indeed be regarded as a safeguard to stability, far more potent than any political or economic device for the protection of interests, and that nation must succeed in industry, which keeps this clearly in view and possesses the talent wherewith to meet the ever changing demands made upon it."

VISCOUNT HAYASHI, the Japanese Ambassador, distributed the prizes to the successful students of the Northern Polytechnic Institute, Holloway, on January 25. In the course of a subsequent address, he said that scientific research made such strides in the past century that it is no exaggeration to assert that the present is the age of practical application in every phase of modern life. Therefore there is nothing more important in a national system of secular education than institutions which keep abreast with the stride of science. Viscount Hayashi explained then that he took part in the administration of the technical college in Tokio. That college was established some thirty years ago with the help of many British professors and men of science whose names are well known in Europe, and from it thousands of students have been sent out to take part in engineering and other works necessitating the scientific application of the mechanical arts. Japan owes very much to that great educational work, and Viscount Hayashi said his people felt grateful for the assistance which Great Britain had given in this department.

THE London County Council School of Marine Engineering at Poplar, which was described in NATURE for October 19, 1905 (vol. lxxii. p. 623), was opened on January 24 by Sir William Collins, M.P. An address was delivered by Sir William White, K.C.B., who expressed a favourable opinion of the arrangements, equipment, and course of study provided in the new institute. He went on to describe the remarkable results attained during the last twenty years by a modest educational scheme which he

had conducted on behalf of the Shipwrights' Company of the City of London. Before 1888 there was no evening class in the Port of London where young men could obtain instruction in the science of shipbuilding. The Shipwrights' Company then undertook to establish and assist evening classes, which have been since carried out successfully and without a break in various parts of the East End. In these classes hundreds of young men have received valuable teaching, and the results have surpassed expectation; many of the students of the evening classes have proved themselves capable of taking the highest training in naval architecture at the Royal Naval College at Greenwich, and elsewhere, and not a few have secured positions of importance and responsibility in the Admiralty service, under the Board of Trade, Lloyd's Register of Shipping, and in private shipbuilding establishments. This object-lesson of what can be done with moderate expenditure, under careful and personal supervision, gives every reason for anticipating much greater benefits from the new institute with its ample means and adequate provision. Sir William White concluded by remarking that technical education for the rank and file as well as for the leaders and captains of industry is of great importance, and in providing the new school and equipping it on so generous a scale the London County Council has shown great wisdom as well as great liberality.

MEN of science have long urged the necessity for the introduction of scientific methods of inquiry and procedure into national administration, and their consistent advocacy culminated recently in the inauguration of the British Science Guild with the primary object of familiarising statesmen and others with the scientific spirit. The first president of the new guild, Mr. Haldane, is the Secretary of State for War in the new Government, and his speech on January 27 at a banquet of the Edinburgh University Liberal Association may well fill men of science with hope that a new era is near in which ideas and the results of scientific research will be taken into account in legislation and administration. Mr. Haldane insisted that national prosperity is not wholly a matter of fiscal policy. Answering the question, Is all well with us? he replied in the negative, because we are lacking in the ideas which science alone can give us, and consequently are lacking in the organisation of our industries. Knowledge, the expert, the spirit of science and organisation to permeate our people, our manufacturers, and workmen alike are all wanted. One of the ways in which the universities can assist the nation is in this direction. Mr. Haldane said his impression is that the Army would be the better for more help from the universities than it had been able to take from them. There are too few officers of the right sort, the thinking sort, like the men in the Engineers and in the Artillery, but of whom there are too few in the Cavalry and the Line. Mr. Haldane thinks he sees the beginning of a movement of this kind; and he hopes the university men will play a distinguished part in the future in obtaining that which is absolutely essential in making the Army an efficient army—a supply of scientifically minded officers and soldiers. The splendid fighting quality in the field which has distinguished the Army in the past, the quickness of eye that is born and that does not come is needed; but with it and behind it, whether in the hands of the general staff or of the commander himself, there must be a knowledge that can only come of the hard and patient discipline of the spirit.

THE cooperation of employers in the technical training of apprentices was a subject of discussion at the annual meeting of the Association of Technical Institutions held last week. A report upon this subject was issued recently by the association, and some of the results of the inquiry were stated in NATURE of December 21, 1905 (p. 188). In a contribution to the discussion, Prof. W. Ripper remarked that his own observation and experience has led him to believe that the unsympathetic attitude towards technical education which used to be so common among foremen and employers in this country is undergoing a change. The apathy and indifference towards educational improvement so general among apprentices and young people will be largely removed when they are made to realise that there is, as a rule, no promotion for them unless they are able to show that they possess educational as well as practical fitness for such promotion. This method of promotion is the one exclusively adopted in the Government dockyards, and the results of it have without doubt been highly satisfactory. In the race for commercial supremacy England, America, and Germany are each, probably, equally well equipped with the most up-to-date machinery and appliances. But these are tools merely. For the real element of success, for the intelligence and virility behind the tools, we depend alone upon the quality of the individual men from top to bottom of the industrial army; and especially do we depend upon the quality of the men at the top—the leaders—whose character, ability, foresight, judgment, power of organisation, and power of inspiration must ultimately determine the degree of success of the efforts of the whole. At present there is too often no connection whatever between the works and the technical school, no knowledge on the part of the employer of the quality of the youths in the colleges, who are available for suitable employment, and, on the other hand, no opportunity on the part of the youths to show possible employers what qualifications they possess, and what claim they have to recognition over the youth who has received no training. A closer relationship between employers and the teachers in technical institutions is therefore demanded in the interests both of public efficiency and of private well-being. In the discussion which followed the reading of Prof. Ripper's paper, Prof. Wertheimer said there is no doubt a steady, if not rapid, improvement taking place year by year. Firms—and the best firms, too—are recognising the desirability of getting into their employ young people whose intelligence has already been trained.

SIR WILLIAM ANSON delivered an address as president of the Association of Technical Institutions, at the annual meeting of the association held last week. In the course of his remarks, he said that the subject which most exercises both the local authorities and the Board of Education is the coordination of the studies which make up our system of education, and especially coordination in such a manner as to give to our technical institutions their proper place and to secure for them their utmost utility. There is no subject more intimately connected with the welfare of the people and the prosperity of our industries. We have paid somewhat dearly for our neglect of science in the past, and not merely for neglect of science, but of any conception of education which can be regarded as scientific or even as systematic. There is one form of error which touches more nearly the elementary schools. We have founded technical institutes, have multiplied libraries and laboratories, but have not taken pains to ensure that those to whom this instruction is offered are capable of taking advantage of it. Time and money are wasted in endeavouring to impart technical instruction to students who have forgotten such elementary mathematics as they ever knew, and who are unable to express their knowledge in their own language in an intelligible form. Everyone ought to know something of science, and everyone would be the better for learning the practical application of some branch of science. But we want the students in technical institutions to come to them able to take advantage of the opportunities which they afford, and not only this, but able to carry forward knowledge which they acquire; not merely to learn something and go away with no idea or intention of following up the instruction which they have received. An educational system may be devised in which all the parts are symmetrically fitted together, in which science pure, and science applied, language, literature, and history are all given their due place, and every arrangement made for the student to pass through courses appropriate to him under teachers fully qualified for their work. But even if these educational ideals are realised, it may be doubted whether we shall get what is wanted until there comes into existence a more widely diffused belief in education, in the value of a trained intelligence as well as of particular information, a belief that experience acquired with knowledge, and knowledge applied with intelligence, are better than that mere experience which is described in the common phrase "rule of thumb." As Sir John Wolfe Barry had said, "We want to see in Great Britain the

man of science installed in his laboratory in all important manufactories and encouraged to help in their development." Great employers have it in their power to advance the education of the people all along the line. Technical instruction in all its stages is a practical thing; and when it is realised that employers appreciate the instructed and intelligent student, then parents will begin to see that education has a practical value. The educational gospel should be "Believe, believe," not only or chiefly in machinery, in a curriculum, a laboratory, a library, but in the value of knowledge, of intelligence, of training, and when we have made this belief widespread an important step will have been taken toward the education of our people.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, December 14, 1905.—"Report on the Psychology and Sociology of the Todas and other Indian Tribes." By Dr. W. H. R. **Rivers.** Communicated by the Secretaries of the Royal Society.

An abstract of observations made chiefly on the Todas of the Nilgiri Hills. The psychological work deals chiefly with the senses, in only two of which is there evidence of decided difference between Todas and Englishmen. The former were less sensitive to pain, and showed certain deficiencies in the colour-sense, especially in the degree of relative sensibility to red and blue, a low degree of sensibility for blue being associated with defective nomenclature for that colour. Definite colour-blindness was found in 12 per cent. of the males, a frequency higher than has been recorded in any other race. Quantitative observations were made on two visual illusions, one of which, that of compared horizontal and vertical lines, was distinctly more pronounced in the Todas, while the other, the Müller-Lyer illusion, was present in a slighter degree. This difference is believed to depend on the difference in nature of the two illusions. Especial attention was paid to the variability of the individuals subjected to the tests, and it is shown that there is some evidence of correlation between the degree of general intellectual development and certain simple mental activities which can be tested by experimental methods.

The sociology of the Todas was studied by means of the genealogical method, and was found to have many points of resemblance with that of Malabar, and the view is advanced that the Todas at one time inhabited that district and are probably of the same race as the present inhabitants of Malabar, the Nairs and Nambutiris. A detailed record was obtained of the elaborate religious ritual of the Todas, and evidence is given that this religion has undergone degenerative changes. It is suggested that this is part of the general disappearance of a higher culture which the Todas brought with them to the Nilgiri Hills.

"On the Spectrum of the Spontaneous Luminous Radiation of Radium. Part IV.—Extension of the Glow." By Sir William **Huggins,** K.C.B., O.M., F.R.S., and Lady **Huggins.**

In our second paper[1] we suggest "whether the β rays, which are analogous to the kathode corpuscles, may not be mainly operative in exciting the radium glow. On this surmise it would be reasonable to expect some little extension of the glow outside the limit of the solid radium itself. We are unable to detect any halo of luminosity outside the limit of the solid radium bromide; the glow appears to end with sudden abruptness at the boundary surface of the radium." We omitted to state that this conclusion was arrived at by eye observations. The radium was observed in the dark with a lens, and with a low-power microscope.

The earlier photographs of the spectrum of the glow were taken, for the purpose of comparison spectra, with the height of the slit reduced by shutters so as to be within the width of the exposed radium bromide, and, therefore, these photographs would not show whether the bright bands of nitrogen extend into the air beyond the radium. Subsequently photographs were taken with the whole height of the slit, and on these we find that all the bands of nitrogen do extend to some little distance outside the radium salt. Our attention at the time being directed to other phenomena of the glow, we did not examine the photographs to see if the nitrogen bands extended beyond the radium.

In a paper, dated August 22, 1905, F. Himstedt and G. Meyer[1] state that in their photographs of the spectrum of $RaBr_2$, the four nitrogen bands, 3577, 3371, about 3300, and 3159, extend beyond the radium salt, while the other less refrangible bands are not traceable outside the radium. In our photographs all the nitrogen bands project beyond the radium salt, the relative distance to which the extension can be detected in the case of each band being, as might be expected, in proportion to the strength of the impression of that band upon the photographic plate.

B. Walter and R. Pohl, in a paper dated September, 1905,[2] give an account of experiments made with the help of screens, which show that for a distance of up to about 2 cm. the air surrounding radium bromide has an action on a photographic plate.

On re-examining an early photograph, taken in 1903 for another purpose, which is described in our second paper,[3] in which the $RaBr_2$ was enclosed in a very narrow tube of thin glass, we find that the bands of nitrogen, which are strong within the tube, show no trace of extension on the plate beyond the tube. The exposure of this plate was seven days.

This experiment, which we have repeated recently with an exposure of fourteen days, shows that the luminosity of nitrogen in the near neighbourhood of radium bromide is not due to the kathode-like β radiation, for this passes freely through glass.

Two explanations may be suggested: first, that the active cause is the α rays;[4] or secondly, that the nitrogen molecules which encounter those molecules of the radium which are undergoing active changes are broken up into ions, which are projected outwards, and give rise to the glow of luminous nitrogen.[5]

Royal Astronomical Society, January 12.—Mr. W. H Maw, president, in the chair.—Photograph of comet *c*, 1905, taken at the Royal Observatory, Greenwich, on January 8: **Astronomer Royal.** The photograph showed the comet with a bright nucleus and a faint, straight tail extending about 2°. It was hoped that further photographs would be obtained after the comet had passed the sun.—The ring nebula in Lyra: E. E. **Barnard.** A careful series of measures of the positions of the stars about the nebula appeared to show that the star in the centre of the ring had neither proper motion nor parallax.—Mean areas and heliographic latitudes of sun-spots in the year 1904: **Astronomer Royal.**—Photographic reproduction of *réseaux* for star photography: H. **Bourget.** Specimens of the *réseaux* were shown on the screen.—Report on observations of Jupiter at Trincomali, Ceylon, 1904-5: Major P. B. **Molesworth.** Special attention was directed to the remarkable movement of the south tropical dark area in the neighbourhood of the great red spot. The motion of the area across the red spot bay was so rapid that it seemed necessary to assign some cause other than the actual transference of matter.—Measures of wide double stars: Rev. T. E. **Espin.**—Action of the wood of the dark slide upon photographic plates: Prof. H. H. **Turner.** The plates were negatives of the solar eclipse taken at Aswan by Mr. J. H. Reynolds, which were greatly injured by strong impressions of the grain of the wood of the dark slides in which they were placed after exposure. The same had occurred to Dr. Copeland's plates taken in 1898. It was stated that the wood of Mr. Reynolds's slides was very old, and various suggestions were made, but the real cause of this effect upon the plates still appeared obscure.—Lunar nomenclature: W. **Goodacre.**—Measures of the lunar crater Mösting A made at the Royal Observatory, Greenwich: **Astronomer Royal.**

[1] *Roy. Soc. Proc.*, vol. lxxii., p. 410 (1903).

[1] F. Himsted and G. Meyer, *Ber. d. Nat. Gesells. Freiberg* vol. xvi. pp. 13-17.

[2] B. Walter and R. Pohl, *Ann. de Phys.*, vol. xviii., p. 406.

[3] *Roy. Soc. Proc.*, vol. lxxii., p. 412.

[4] B. Walter, July, 1905, showed by means of absorption screens that the radiation from radio-tellurium can produce the ultra-violet light of nitrogen (*Ann. d. Phys*, vol. xvii., p. 367).

[5] The experiments described in our last paper showed that probably the β rays are not the operative cause of the nitrogen glow (*Roy. Soc. Proc.*, vol. lxxvi., p. 488).