

our legislators and administrators is in no way to belittle other kinds of knowledge. As the Rector of the Imperial College of Science and Technology said in a recent address, "the scientific man is, after all, first a man and then a man of science, nothing which leaves out of sight his obligation to rule his life in accordance with the highest standards of health, of religion, and of morals, can fairly be called a good education." The student of science, then, must not ignore that great body of humanistic learning which has always been held in high esteem at our ancient universities. There is every reason why the man of science should be so far as practicable also a man of letters. Humanists and men of science alike must remember, indeed they are remembering, that culture is something broader and higher than mediæval schoolmen imagined. The scholar steeped in classical lore, yet ignorant of nature and her laws, is, we are beginning to realise, an uneducated pedant. The specialist in science, sublimely unconscious of the beauties of literature, and knowing nothing of the ideas of ancient and modern poets and philosophers, is a hopeless Philistine. How much the man of science may learn from the man of letters, and how beneficial to scientific work the influence exerted by literature may be, the Vice-Chancellor showed convincingly towards the end of his address.

I think no less that the man of science has much to learn from the man of letters. It has certainly been the case that the best men, or many of the best men, of science have been men full of the love and spirit of letters, keenly sensible of the beauty and attraction both of poetry and of prose. It was the case, as we all know, with Huxley and with Tyndall. It was so with Helmholtz, whose intellectual relation to Goethe is a most interesting episode. The fact is not so generally recognised, but it was the case with Darwin. It may seem a paradox to say that Darwin was a "man of letters," but I am almost prepared to maintain it. Too much has been made of the well-known passage in his autobiography in which he describes how he lost, through atrophy, his love for poetry, and not enough has been made of the warmth and the keenness of that love in his earlier days. He was a boy at Shrewsbury in the ultra-classical days of that very classical school, and was rebuked by Dr. Butler, the headmaster, who called him a "*pococurante*" because he worked at chemistry. But he tells us that he was very fond at school of the "Odes" of Horace; and when we find him, in that delightful book, the "Voyage of the Beagle," quoting in a few consecutive pages lines from the "Third Aeneid" of Virgil and from Shelley in the most natural and spontaneous manner, I think we may assert that his love of letters was lively and deep, and likely to have a permanent effect on himself. I have always thought some of the pages of the "Origin of Species"—for instance, the concluding pages—among the most poetical pieces of prose in the English language, and I think the secret of that style is to be found partly in the hereditary gift of his family, and partly in the early cultivation which it received. Again, few things are more fascinating to the thinker than the history of early Greek philosophy—those wonderful guesses (afterwards passed on to the Romans) with which the Greek thinkers anticipated in an intuitive and in exact manner the theories and demonstrations of later science. I would have the student of Dalton familiar with the guesses of Democritus and their repetition by Lucretius, and familiar, if possible, with them in their place in history. I would have the student of Aristotle read Darwin, and the student of Darwin read, as Huxley did, his Aristotle.

Dr. Warren's address, as we have said, may well fill men of science with hope as to the future of our old universities. It has often been our duty to point out in these columns how the nation has suffered from the erroneous ideas which have prevailed at Oxford and elsewhere as to the educational needs of

students destined to become members of Parliament or civil servants in high places. Again and again insistence has been laid on the fact that the kind of education suited to the conditions of the days of the Renaissance is not in harmony with present-day needs. The work of men of science in the last hundred years has revolutionised life, but it is only now that it is beginning to be understood that the education given by our universities and by our schools of every grade must be adapted to present and coming needs.

Recent years have witnessed in many of our great provincial cities the growth of new universities fired with modern ideals; universities which look to the union of the scientific spirit with all that is best in humanistic learning to produce men cognisant of modern needs and conditions, and fitted to grapple with the difficulties inseparable from the administration of a great empire. The increasing competition among the great nations for pride of place, whether in industrial warfare, in intellectual rivalry, or in the contest to secure the most satisfactory social conditions, will be decided eventually in favour of the people most able to apply the methods and conclusions of science. In other words, that nation will prevail which succeeds in best educating at its places of higher learning the men in whose hands its destinies must be placed.

These truths are understood at our new universities, and modern requirements are shaping their regulations, their courses of work, and their general administration. Dr. Warren's address leads us to believe that the aims and objects of the new universities are appreciated at Oxford, and that it is intelligently and completely known by the university authorities that no slackening of effort and no fainting by the way must be permitted in the work which has been so successfully begun of making Oxford a great scientific university.

#### FIBRES FOR PAPER-MAKING.

THE Agricultural Department of the United States is investigating various fibrous waste materials with a view to their conversion into paper-makers' pulps or "half-stuffs." The *Times* of October 17 publishes a note giving some results of the experimental treatment of maize stalks, which are pronounced satisfactory.

The matter is of considerable importance. There exist a certain number of waste materials, such as megasse, cotton-seed hulls, flax and hemp straws of non-textile quality, which contain fibres useful for paper-making, and are available in concentrated areas in adequately large quantity to furnish "half-stuffs" in such volume as to be a serious factor in the determination of the world's supply, and therefore in controlling the ultimate cost of paper.

In considering these sources of supply, it is important to draw a sharp distinction between technical success and commercial success. All the above wastes have been, not once, but many times over, successfully worked up into papers of good quality. But for one reason or another the economic conditions for their industrial development have been lacking. A notable exception to this list of failures is the fibre of the cotton-seed hull. Within the last two years a definite industrial success has been recorded with this fibre, as the result of a treatment which is mainly mechanical. The fibre, purified from the adherent particles of shell, is now on the market under the name of "Virgo fibre."

Megasse, bamboo, and Para grass are being treated in Trinidad on practical lines; the half-stuffs and resulting papers are of remarkable quality, and the promises of industrial development are not unfavourable.

Flax and hemp straws constitute an attractive material, but all attempts to treat them on chemical lines have necessarily proved uneconomical. There is, however, every reason to expect that their successful exploitation, by the mechanical separation of their useful fibres in the districts where they are grown, is not far distant.

#### NOTES.

THE 200TH anniversary of the birth of Albrecht von Haller—anatomist, physiologist, botanist, and poet—was celebrated on Friday of last week by the unveiling of a statue in his native city of Berne. The celebration was made the occasion of a public holiday, and was participated in by the State and municipal authorities, as well as by the professors and students of the University. It was also attended by delegates from numerous universities and learned societies, especially those with which Haller had been connected, the Royal Society being represented by Dr. Arthur Gamgee and the Royal Society of Edinburgh by Prof. Schäfer. An account of the proceedings will be given in a future number of NATURE.

WE are glad to notice that the King has appointed a Royal Commission to make an inventory of the ancient and historical monuments and constructions connected with or illustrative of the contemporary culture, civilisation, and conditions of life of the people in England from the earliest times to the year 1700, and to specify those which seem most worthy of preservation. The commission is constituted as follows:—Lord Burghclere (chairman); Earl of Plymouth, C.B.; Viscount Dillon; Lord Balcarres, M.P.; Sir H. H. Howorth, K.C.I.E., F.R.S.; Sir John F. F. Horner, K.C.V.O.; Mr. E. J. Horniman, M.P.; Dr. F. J. Haverfield, Camden professor of ancient history in the University of Oxford; Mr. L. Stokes, vice-president of the Royal Institute of British Architects; Mr. J. Fitzgerald, assistant secretary to H.M. Office of Works; and Mr. J. G. N. Clift, hon. secretary to the British Archaeological Association. The secretary of the commission is Mr. H. Duckworth, 35 Charles Street, Berkeley Square, W.

M. HENRI POINCARÉ has succeeded the late M. Henri Becquerel as president of the French technical commission on radio-telegraphy, appointed by a decree of March 5, 1907.

M. VIOILLE has been appointed president of the Bureau national scientifique et permanent des Poids et Mesures of Paris, in succession to the late M. Mascart.

PROF. T. L. WATSON, professor of economic geology in the University of Virginia, has been elected director of the Virginia Geological Survey, and Dr. J. S. Grasty has been appointed assistant geologist.

WE are requested to state that the annual "fungus foray" of the Essex Field Club will be held at Theydon Bois, Epping Forest, on Saturday, October 31. Mr. George Massee, of the Kew Herbarium, will act as principal referee, assisted by many botanists. Any botanist wishing to attend the meeting should write to Mr. W. Cole, hon. secretary, Buckhurst Hill, Essex, who will be glad to send programmes.

THE Gunning prize, 1908, having the value of about 40*l.*, will be awarded for an essay on "The Attitude of Science towards Miracles." The last day on which essays can be received for competition is March 31, 1909. Full

particulars of the conditions can be obtained from the secretary of the Victoria Institute, 1 Adelphi Terrace House, London, W.C.

THE death is announced of Prof. Adolf Wüllner, at Aix-la-Chapelle, at the age of sixty-three years. Wüllner was known for his work on the specific heat of liquids and gases, vapour tension, refractive indices, and the variability with temperature and pressure of absorption and emission spectra. He was the author of a standard "Lehrbuch der Experimentalphysik," which reached a fifth edition.

THE death is announced of Mr. R. B. Smith in his seventieth year. Mr. Smith was formerly an assistant-master in Harrow School, and was a keen field naturalist. Among his published works is one entitled "Bird Life and Bird Lore," containing a number of interesting articles upon birds and their habits.

THE fourth annual fossil-hunting expedition of Amherst College, Massachusetts, has just returned from a successful visit to the plains of Wyoming and Nebraska. It has collected between 3000 and 4000 Indian relics, a full skeleton of an extinct species of camel, parts of a skeleton of a huge rhinoceros, the jaws of a prehistoric dog, and other bones of the progenitors of the horse, dog, camel, cat, deer, beaver, peccary, &c. The expedition was led by Prof. Frederick B. Loomis.

PROF. G. HELLMANN, president of the German Meteorological Society, asks us to announce that a prize of three thousand marks (150*l.*) is offered by the society for the best essay upon the meteorological results obtained in the exploration of the atmosphere by the international kite and balloon ascents. The prize is open to all nationalities, but the essays must be written in German, French, or English, and must be sent in before December 31, 1911. Further particulars can be obtained from Prof. G. Hellmann, Berlin W. 56, Schinkelplatz 6.

WE learn from the *Times* that an International Fire Prevention Conference was opened on October 14 at the Conservatoire of Arts and Crafts, Paris. The conference has had under consideration the formation of a permanent French fire and accidents prevention committee, resembling the British Fire Prevention Committee, and the equipment of a testing station near Paris. Numerous technical matters relating to fire protection have been discussed, including the standardisation of the preventive measures of the European countries.

A SHORT time ago we directed attention to an appeal for a fund, formed under the auspices of Mr. H. M. Taylor, F.R.S., of Trinity College, Cambridge, with the object of assisting in the publication of works of a scientific nature in embossed type for the use of the blind. The sum of about 52*l.* was subscribed, and the managers of the fund have agreed that the first three books in the publication of which they undertake to assist shall be "Sound and Music," by Mr. Sedley Taylor; "A Primer or Astronomy," by Sir Robert Ball, F.R.S.; and "An Introduction to Geology," by Dr. Marr, F.R.S.

THE council of the Royal College of Surgeons at its quarterly meeting on October 16 adopted resolutions which will in future admit women to the examinations of the conjoint examining board in England, to the examination for the diploma in public health, to the examinations for the fellowship, and to the examinations for the license in dental surgery. This decision brings to an end an agitation which has been carried on for some twelve or