

glass. No German glass is used, and during the war a considerable amount of excellent optical glass has been made by the range-finder manufacturers themselves.

MR. JOHN MURRAY'S new list of announcements contains the following forthcoming books:—"Travels in Egypt and Mesopotamia in Search of Antiquities, 1886-1913," Dr. E. A. Wallis Budge, 2 vols., illustrated, in which is given the story of the author's missions to Egypt, the Great Oasis, and Mesopotamia, the results of his excavations at Acevân and Nineveh and Der in Babylonia, and particulars of the excavations in Assyria and Babylonia from 1782 to 1913; a new and revised edition of "Heredity," Prof. J. Arthur Thomson, illustrated; "The Adventure of Life," Major R. W. McKenna, R.A.M.C., dealing with the question of the origin of life, and showing that, in the development of higher forms and the "survival of the fittest," intelligence, and not brute strength, has been the dominating factor; and "Hints to Farm Pupils," by E. Walford Lloyd, the aim of which is to put in concise terms the most important features of farming which a pupil must master. The volume will contain a seasonal "Calendar of Farm Work."

OUR ASTRONOMICAL COLUMN.

THE COMET 1786 II.—This comet is of interest as being the first of the eight comets discovered by Miss Caroline Herschel. It was observed for eighty-two days, being visible to the naked eye for a fortnight. The observers were Maskelyne (Greenwich), Wollaston (Chislehurst), Méchain and Messier (Paris), and Reggio and Cesaris (Milan). Miss Margaret Palmer, who has made a re-investigation of the orbit (*Astr. Journ.*, No. 744), finds the following ellipse as the most probable orbit:—

$$\begin{aligned} T &= 1786 \text{ July } 7^{\text{h}} 91^{\text{m}} 85^{\text{s}} \text{ Berlin M.T.} \\ \omega &= 324^{\circ} 57' 59.23'' \\ \Omega &= 194^{\circ} 27' 11.37'' \\ i &= 50^{\circ} 55' 5.97'' \end{aligned} \left. \vphantom{\begin{aligned} T \\ \omega \\ \Omega \\ i \end{aligned}} \right\} 1786 \text{ o}$$

$$\begin{aligned} \log q &= 9.6128774 \\ \log e &= 9.9995992 \\ \text{Period} &= 9373 \text{ years.} \end{aligned}$$

The observations are fairly satisfied by orbits ranging from an ellipse with period 3300 years to a parabola. Perturbations by Mercury, Venus, the earth, and Jupiter have been applied.

PARALLAX OF THE BARNARD STAR.—*Astr. Nach.* (No. 4971) contains a determination of the parallax of this star, made by photography at Pulkova by Dr. S. Kostinsky. He finds $0.622'' \pm 0.022''$, a larger value than those found in America, which group themselves about $0.53''$. He gives for the proper motion in R.A. -0.0438s. , in decl. $+10.249''$. Place at epoch 1917.473 17h. 53m. 46.456s., $+4^{\circ} 27' 57.28''$ (equinox of 1917.0). Photographic magnitude, 10.6; photo-visual (with yellow filter), 9.4

THE BRITISH SCIENCE GUILD AND ITS EXHIBITIONS.

AT a dinner given at Princes' Restaurant on January 15 several speeches were made concerning the results of the British Scientific Products Exhibition held by the British Science Guild in August and September last, and also the work of the guild for the advancement of science and its application to industry.

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The Marquess of Crewe, president of the exhibition committee, was in the chair. After the usual loyal toasts he proposed "The British Science Guild," alluding to the valuable educational work which it had conducted since its foundation in 1905. The war had brought home to everyone the value of scientific method and knowledge, not only as a weapon in war, but also in industry and education. In these respects our adversary Germany had truly eaten of the tree of knowledge, but that fruit had turned to poison because of the spirit in which it was eaten. Our task must be to dissociate science from this disastrous spirit, to show that the proper applications of science, pursued with reverence and humanity, added immensely to the happiness of mankind. The guild had pursued two main objects, which were, however, closely related. It desired, first, to secure fuller attention to science in the general education of youth. While a sound general education was necessary as a preliminary to technical specialisation, this general education should contain a fair proportion of scientific studies. The second object of the guild was to promote the higher branches of scientific research and to encourage their application to industry. As the Minister who brought into being the Department of Scientific and Industrial Research, he observed with pleasure the closer relations being established between science and industry and the growing recognition of the benefits of industrial research—results which were due, in a large measure, to the influence of the British Science Guild. The exhibition had proved a wonderful revelation of the possibilities of science. He hoped that it would be a permanent feature in the industrial life of the country, and that in future the guild would continue to flourish and play its part in the advancement of learning and science.

Lord Sydenham, who replied on behalf of the British Science Guild, referred to some of the difficulties encountered at the outbreak of war. For a long time we were dependent upon improvisation for articles urgently needed by the Army, Navy, and Air Service, and it was due to the efforts of British men of science that these needs had been met. Lord Sydenham proceeded to mention various instances of discoveries made in this country but afterwards developed abroad. Perkin's discoveries in relation to dyes furnished a well-known example. Helium gas was first discovered in the sun by Sir Norman Lockyer, and twenty-six years later was identified on the earth by the late Sir William Ramsay, these two distinguished men being the founders of the guild. The Americans are now producing it in large quantities as a non-inflammable gas for the inflation of airships. The British Science Guild aimed at the co-ordination of science, education, and industry. The British Scientific Products Exhibition had shown what British men of science could do. Another exhibition on a larger scale was planned for the present year. In the difficult reconstruction period science and scientific methods of direction in the Government could do a great deal to recreate national prosperity and provide happier and healthier conditions of life.

Mr. F. G. Kellaway, M.P., Parliamentary Secretary, Ministry of Munitions, in proposing "The Exhibitions of 1918 and 1919," said that events during the war had aptly illustrated the romance of applied science. Experience belied the idea that John Bull was a sluggish and lethargic person. It would be fitter to apply the description uttered by Milton two hundred and fifty years ago: "A nation that is not slow and dull, but a quick, ingenious, searching spirit, acute at invention." In proof of this he would mention two inventions relating to defence against hostile air-

craft. One of these was the simple and ingenious sound-ranging apparatus that had enabled search-lights to pick up, almost invariably, enemy machines over London. The secret of the other device was still locked up in the Ministry of Munitions, but the weapon was so powerful that hostile aircraft could not face it. Both these inventions were mainly due to men whose names were unknown to the general public. Mr. Kellaway also quoted facts to show how British manufacturers, aided by science, had met the sudden demands of the war. Sixty per cent. of the world's stores of mica, a material essential in the electrical industry, were located within the British Empire, yet before the war 50 per cent. was sent to Germany for treatment. Now things were very different. Similarly, we had formerly to go to Germany for magnetos and ignition plugs, yet to-day the British magnetos and plugs were the best in the world, and the output of these two articles had risen enormously during the war. It was the task of the British Scientific Products Exhibition to make such facts known and to encourage similar advances in the future.

This toast was responded to by Sir Robert Hadfield, who supplemented the remarks of the last speaker by referring to some of the achievements of the iron and steel industry. The biggest shell used in the war, 18 in. in diameter and weighing $1\frac{1}{4}$ tons, was produced in this country. It was capable of penetrating armour-plate 41 in. thick; at a range of ten miles it would still penetrate 22 in., and at twenty miles $12\frac{1}{2}$ in. of armour-plate. We should not, however, follow Germany in using science as a weapon of aggression, but would, as the chairman said, apply it for peaceful ends in the spirit of reverence and humanity. Sir Robert proceeded to give some facts showing the success of the British Scientific Products Exhibition, which had attracted more than 30,000 visitors in London and 15,000 in Manchester—more than 45,000 in all. This year they hoped to make the exhibition much wider in scope. He wished to thank all who had contributed to the success of the exhibition in 1918, and referred especially to the services of the chairman of the organising committee, Prof. R. A. Gregory, and the secretary, Mr. F. S. Spiers.

The toast of "The Donors of the Exhibition Fund" was proposed by Mr. Charles F. Higham, M.P., who acted as honorary director of publicity to the exhibition. Mr. Higham explained that the cost of the exhibition had been defrayed from private enterprise, and it had not been assisted by the Government. He wished to express thanks to all those who had given their support, including the original donors (Sir William Mather, Sir Robert Hadfield, and Mr. Robert Mond) and the manufacturers who had responded to the invitation of the organising committee to contribute. Now that the exhibition had proved its worth he hoped many other manufacturers would participate on the next occasion, and that their contributions would be even more generous than in the past year.

Mr. Milne Watson, responding for the donors, emphasised the value of scientific methods of test in improving the quality of products, using as an illustration some experience in the ammonium sulphate industry. Manufacturers must be taught that the perpetuation of mediocre methods was wrong, and that it paid to use every available scientific weapon to secure the finest possible results.

In the absence of Mr. John Hodge, M.P., the toast of "The Chairman" was proposed by Prof. d'Arcy Thompson, the Marquess of Crewe briefly responding. This terminated the proceedings. The dinner was attended by about 150 men of science, manufacturers, and others associated with the exhibition.

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EDUCATIONAL CONFERENCES.

THE seventh annual conference of Educational Associations, comprised of thirty-four educational societies, which was numerously attended, was opened at the University College, London, on January 1 and concluded on January 11. The inaugural address, characterised by abundant wit and humour, was delivered by Mr. Fisher, the President of the Board of Education. The conference week included also the annual meetings of the Headmasters' Conference, the Incorporated Association of Headmasters, the Association of Directors and Secretaries of Education, and the Association of Public School Science Masters, some of the proceedings of which have already been reported in NATURE.

At a joint conference of the educational associations held on January 3 an interesting address by Prof. John Adams, who is now in France, was read on "The Utility Motive in Education," in which he urged that pure knowledge often owed its opportunities to the help offered by practical applications, which he illustrated by reference to the strides made by physiology, the progress of which had hitherto been slow, so soon as it became associated with the teaching of students of medicine; to psychology, when education captured it, and it became included in the professional training of teachers; to navigation, which made possible the development of pure astronomy; and, lastly, to the technical demands of dyers and other practical people, which had led to such subsidising of chemistry teaching as had greatly favoured the disinterested study of the subject. Might we not find in all this, he said, some justification for the plea that a working arrangement could be made by means of which a clash might be prevented between the claims of the cultural and the utilitarian ideals? The demands of the practical man might be met, not only without forfeiting the right to carry on disinterested work, but also in a way to favour such work in its proper place. Man was one and indivisible; he must be trained to hold his own in both spheres, utilitarian and cultural. Knowledge that refined a man's character was as useful as knowledge that increased his productive power in a material sense. The swing of the pendulum was at present strongly in favour of the practical, and a hard fight might be necessary to get due attention to the other aspect. But they would certainly not succeed in maintaining a due proportion of the cultural elements if they set out on a crusade for the useless.

Miss Mercier, head of Whitelands College and president of the Training College Association, in delivering her presidential address to the latter, pleaded for a higher type of education for students training as teachers. The training college might, and should, become also a school of social service. Neither reading alone, nor desire of service alone, made the good teacher, but a blend of both. Students would often benefit by a university course, but some would not be suited to it. There should be large liberty in devising courses. Mr. George Lansbury, who spoke later to the same body upon teaching, urged that the teachers should cultivate a really radical outlook, by which he meant that outlook on life which went to the root of things. Unless there were a tremendous amount of idealism in the teachers, they would not make very much impression upon the children.

At the meeting of the Eugenics Education Society Prof. J. Arthur Thomson, of Aberdeen, gave an address on "The Eugenic Ideal of Education," which he defined as the organic improvement of the human breed, but one which, though primarily a biological ideal, had an horizon far wider than the poultry yard