

## Current Topics and Events.

WE are glad to see that noteworthy recognition is accorded to science in the New Year honours list which was issued last week. The appointment of Sir James G. Frazer and of Sir Ernest Rutherford to the Order of Merit, an order which was "designed as a special distinction for eminent men and women" and is limited to twenty-four members, will give particular pleasure to scientific workers everywhere. Included among the honours are also the following:—*Knights*: Prof. John Adams, Professor of Education, University of London, 1902–1922; Prof. R. H. Biffen, Professor of Agricultural Botany, Cambridge University; Mr. G. R. Clarke, Director-General, Posts and Telegraphs, India; Dr. Hari Sing Gour, Vice-Chancellor, Delhi University; Mr. W. B. Hardy, Secretary of the Royal Society; Prof. F. Gowland Hopkins, Professor of Bio-Chemistry, University of Cambridge; Principal J. C. Irvine, Principal and Vice-Chancellor of the University of St. Andrews; Mr. F. Truby King, Director of the Child Welfare Division of the Department of Health, Dominion of New Zealand; Dr. T. M. Legge, Senior Medical Inspector of Factories; Mr. B. Longbottom, Chairman, British Electrical and Allied Manufacturers' Association; Maj.-Gen. R. C. Macwatt, Director-General, Indian Medical Service; Mr. E. W. Petter, President, British Engineers' Association; Dr. H. J. Waring, Senior Surgeon, St. Bartholomew's Hospital, Vice-President, Royal College of Surgeons, Vice-Chancellor of the University of London, 1922–1924. *C.I.E.*: Mr. H. G. Billson, Chief Conservator of Forests, and Member of the Legislative Council, United Provinces, India. *D.B.E. (Civil Division)*: Miss L. B. Aldrich-Blake, Dean of the London School of Medicine for Women.

AMONG the mechanical inventions which revolutionised the cotton industry was the cotton gin of Eli Whitney, whose death took place on January 8, 1825—a hundred years ago. The flying shuttle of Kay, the spinning jenny, the water frame and the mule of Hargreaves, Arkwright and Crompton, together with the power loom of Cartwright, increased enormously the rate of spinning and weaving, but the cleaning of the cotton fibre from the seed was still largely done by hand. Whitney's great invention was made in 1792, and in about ten years the export of cotton from the United States rose from less than 200,000 pounds to more than 40,000,000 pounds per annum. The essential parts of Whitney's machine consisted of a grid on to which the seeds were fed, a revolving wooden cylinder studded with wire teeth which tore the fibre from the seed, and a revolving brush which in turn removed the fibre from the wires. One such machine would do the work of 50 men engaged in hand-picking. Whitney was born in 1765—the same year as Fulton—and was the son of a farmer of Westboro, Massachusetts. He worked as an artisan, made money by teaching, and in 1792 graduated from Yale. When about to take up a post as tutor, a chance conversation led to his tackling the problem of cotton cleaning. His gin soon came into use and he had to establish

his claims by much litigation. Later, he founded a factory at New Haven for the manufacture of fire-arms and was the pioneer among Americans in the modern methods of making large numbers of interchangeable parts. He died at New Haven, leaving a part of his fortune to Yale for the purchase of books on physical and mechanical science.

THE year 1924 was a year of notable centenaries, but one of scientific interest seems to have been overlooked, namely, that of the establishment of the first physiological laboratory in Europe. The man who opened this laboratory in the year 1824 was Johannes Evangelista Purkinje, at that time professor of physiology and pathology at the University of Breslau. It has been suggested that it was through Goethe's influence that Purkinje was appointed to this chair, for the author of "Faust" reckoned him as one of his friends, their common interest being in subjective visual phenomena. The reception given by the Prussians to the Bohemian Purkinje was far from cordial, but by his amiability and scientific gifts he lived down all opposition. The laboratory of 1824 was not housed in any building belonging to the University but in the professor's private dwelling. Doubtless the establishment of this first of European physiological laboratories attracted no attention from the contemporary journalists; but when we reflect on the immense benefits which have accrued to medical science from the findings in the laboratories of practical physiology—insulin being one of the latest—all men of science will like to remember that it is just a few days more than one hundred years ago that the academic pursuit of that subject was inaugurated. So far as we can gather, the instruction in Purkinje's laboratory was chiefly in histology, a subject which the anatomists willingly allowed the physiologists to teach for the next century. It is only now that that portion of the physiologists' burden is being cast, where it belongs, upon the shoulders of the morphologists.

A WRITER who signs himself "Poetarum Minimus" enters a plea in the *Scientific Worker* for December for the exercise of poetic expression in scientific fields, and as an example he submits a contribution having for its theme the evolution of stars from "tenuous mists" up to maturity and down to decay. Thus,

A hundred million million years they scatter largesse of their rays.  
They spend their substance royally throughout the measure of their days.

The verses from which these lines are taken have commendable dignity and sound, and they are reminiscent of the style of Erasmus Darwin, who essayed similarly to express views of the stellar universe current in his time in the sonnet, "Roll on ye stars, exalt in youthful prime." Tennyson surpassed all other poets in the application of scientific truth to poetic purpose, and his astronomical allusions are particularly fine, as, for example, in "This world was once a fluid haze of light," and "Regions of lucid matter, taking form: Brushes of fire, hazy gleams."

Several years ago the geological course of events, from "Nebula to Man," was described in verse in a sumptuous quarto volume by the late Mr. Henry Knipe, and Mr. Alfred Noyes has given us his beautiful epic, "The Torch-bearers," which is on a much higher plane. Poetry, however, is something more than accurate description in verse form. It should, of course, have a certain beauty of sound when spoken, but its main function is the creation of stimulating thoughts which appeal to the human heart rather than to the intellect. While, therefore, we may believe that the wonders of modern science furnish rich material upon which poetic imagination may be worthily exercised, we cannot forget that emotion is independent of knowledge, and that, as Coleridge said, science seeks to know and communicate truth—acceptable or not—but the chief purpose of poetry is to give pleasure. The difference is aptly expressed by Sir William Watson in one of his epigrams, thus :

Science and Art, compeers in glory,  
Boast each a haunt divine.  
"My place is in God's laboratory,"  
"And in His garden mine."

A NEW Research Institute for the improvement of crops, at which special attention will be paid to cotton and to the fundamental problems underlying the production of this crop in India, was formally inaugurated at Indore in Central India on November 24 last. The foundation of this new Institute has been rendered possible by the provision of a valuable site of 300 acres by the Indore Durbar, by a grant of two lakhs of rupees (about 15,000*l.*) for capital expenditure by the Indian Central Cotton Committee, and by an annual contribution of 120,800 rupees a year (a little more than 9000*l.*) for current expenses in addition to the income derived from the land at the disposal of the Institute. This annual grant has been provided jointly by the Indian Central Cotton Committee and by seven of the Central India States (Indore, Dhar, Jaora, Datia, Rutlam, Dewas Senior Branch, Narsingharh and Sitamau). The control of the Institute has been vested in a governing body of six members with the agent to the Governor-General in Central India as president. Three members of the board of governors are nominated by the Indian Central Cotton Committee, one by Indore Durbar, and two by the rest of the contributing States. The Director of the Institute will act as agricultural adviser to the States, and will in this way come in direct touch with the Malwa plateau, one of the most important cotton tracts in India.

THE experimental area which will be at the disposal of the new Research Institute, has been leased by the Indore Durbar to the Institute for 99 years at a nominal rent of 20*l.* a year; it embraces all the types of black cotton soil met with in India, and is very favourably situated for research work on crops. It is close to the city of Indore, now rapidly growing in importance as a commercial, manufacturing, and educational centre, and to the cotton mills. The maintenance of an up-to-date library on crop-produc-

tion and the training of post-graduate students, selected by the Indian Central Cotton Committee, will be features of the Institute. Mr. Albert Howard (formerly Imperial Economic Botanist at the Agricultural Research Institute, Pusa) has been appointed Director of the Institute and agricultural adviser to States in Central India, and Mrs. Howard (formerly second Imperial Economic Botanist at Pusa) will be employed as physiological botanist at Indore.

ON Tuesday, January 6, Sir Oliver Lodge gave the first of his series of seven fortnightly talks on "The Ether of Space and its Functions," under the auspices of the British Broadcasting Company at 2LO, which was relaid to many stations in the British Isles, and also to the longer wave high-power station 5XX at Chelmsford. The first talk was entitled "First Notions about the Ether. How Matter is held together, and how we see it." After describing the functions and uses of the ether, Sir Oliver went on to explain that matter was discontinuous, consisting of isolated particles not in contact, and was only held together by cohesive forces existing in the ether. He supposed that if we could magnify a piece of matter to an impossible extent, it would have an appearance something like the midnight sky, where the separated pieces of matter are similarly held together or united into systems by the force of gravitation—which also is a function of the ether. So that the ether is a great unifying entity, without which there would be no cosmos, but chaos. Sir Oliver concluded his first talk thus: "You cannot imagine empty space being thrown into vibration; there must be something in space which vibrates, and that 'something' extends to the furthest visible object, and constitutes a unifying and connecting mechanism, through which all our information is obtained. . . . We have as yet very little acquaintance with the universe; sometimes we seem to know a great deal, at other times we realise that we hardly know anything. The mystery of it all escapes us, and the possibilities of it are beyond our conception: many of them we could not apprehend if they were explained to us, we have not the terms or ideas to understand them. Meanwhile we grope along as best we can, and do our daily work with a keen expectation of the future; and he is wisest who denies least of the mystery which surrounds us and the possibilities ahead. To assert, requires knowledge; to deny, requires much more knowledge. Let us be satisfied with positive knowledge so far as it has been vouchsafed to us, and leave negations to the self-sufficing and the omniscient. We can deny the self-contradictory and the absurd, but in the unknown and the mysterious, denials have no legitimate place: our business is carefully and cautiously to ascertain what is. We are surrounded by infinity, infinities of various kinds; and the wealth of existence is such as to justify a faith in our highest conceptions, a hope in the possibilities which lie before us, and a charity which enables us to do our daily work and to love our fellow men."

GREENWICH weather observations, which give approximately the average conditions over England,

show that 1924 was generally wet and unseasonable. The winter months were mostly mild, while the summer months were mostly cool, and all months were wet with the exception of February, March, and August. The mean temperature for the year 1924 was 50°·6 F., which is 0°·5 F. in excess of the normal. The warmest month was July, with the mean temperature 63°, which is 0°·5 below the normal; the coldest month was February, with the mean temperature 37°·3, being 2°·5 below the normal. December was 3°·5 warmer than the average, and there were only three nights, December 9-11, with frost in the season. June, July, and August were the only months with a temperature of 80° or above, the highest reading being 89° on July 12. The lowest temperature during the year was 21° on February 15. Rain fell on 168 days, yielding a total of 31 inches, which is 7·5 inches more than the average for thirty-five years. The wettest month was July with 4·20 inches, which is 2 inches more than the normal. The driest month was February with 0·65 inch, and this was followed closely by March with 0·69 inch, the deficiency for the two months combined being 2 inches. 1924 is the wettest year since 1903, when the annual measurement was 35·54 inches. In the dry year of 1921 the total rainfall at Greenwich was only 12·50 inches; in 1923, a normal year, the measured rain was 23·86 inches. Sunshine was generally deficient, the only months with an excess of sunshine being January, March, July, and December. Records of temperature and rainfall for London now extend over about the last 200 years, but careful examination of these fails to give any cycle or periodicity which can help in the prognostication of the weather for a coming year or season; 1925 has started with exceptionally wet and boisterous conditions.

ONE of the recommendations made last year by the Departmental Committee on the Fertilisers and Feeding Stuffs Act, 1906 [Cmd. 2125], was the appointment of a committee to consider the articles to which revised legislation should apply. This advisory committee, which has power to co-opt, has now been constituted as follows: Lord Clinton (chairman), Mr. E. G. Haygarth Brown, Dr. Charles Crowther, Mr. J. Garton, Mr. C. W. Higgs, Mr. Arthur Holgate, Mr. Thomas Kyle, Mr. Alexander Main, Lieut.-Col. R. L. Norrington, Mr. J. W. Pearson, Mr. R. R. Robbins, Sir E. J. Russell, Mr. John Speir, Mr. George Stubbs, Dr. J. F. Tocher, Prof. T. B. Wood, and Mr. H. J. Johns, of the Ministry of Agriculture and Fisheries, 10 Whitehall Place, S.W.1 (secretary). According to the terms of reference, the committee is to draw up schedules prescribing the fertilisers and feeding stuffs to which the proposed legislation on the lines of the Report of the Departmental Committee on the Fertilisers and Feeding Stuffs Act, 1906, should apply, and methods of defining and stating the constituents and the "worthless" and "deleterious" commodities are to be considered.

AN interesting new departure in tourist travel is the motor tour across the western Sahara to Timbuctoo. Citroën Cars, Limited, the organisers of the

tour, have sent us an itinerary of the route. The cars leave Colomb-Bechar, the railway head of the Algerian railway, and pass by Igli and Beni-Abbes to Adrar, the centre of the Tuat region. Thence they pass by Taouriot and strike almost due south, reaching the Niger at Burem. From Burem the traveller can continue in cars to Gao or Niamey, with the alternative of going by motor boat to Kabara and car to Timbuctoo. From Colomb-Bechar to Timbuctoo by this route is 1700 miles, and the time occupied is eight days. Timbuctoo is thus brought within twelve days of London, and there is a trans-Saharan service twice weekly. Modern hotels have been constructed at Colomb-Bechar, Beni-Abbes, Adrar and Timbuctoo, while at other stopping-places the company maintains camps. It is of interest to note that this motor service to Timbuctoo has been instituted within a year of the centenary of the first European traveller entering what was then the mysterious city.

MR. MURRAY MACGREGOR, district geologist, has been appointed assistant director of the Geological Survey in Scotland in succession to Dr. Walcot Gibson.

IN connexion with the Liverpool Section of the Society of Chemical Industry, Sir Max Muspratt, Bart., will deliver a Hurter Memorial lecture in the chemistry lecture theatre of the University of Liverpool on Friday, January 16, at 8 o'clock, on "Chemistry and Civilisation."

PROF. G. T. MORGAN, professor of chemistry in the University of Birmingham, has been appointed Superintendent of the new Chemical Research Laboratory of the Department of Scientific and Industrial Research at Teddington. Prof. Morgan was awarded the Research Medal of the Worshipful Company of Dyers in 1922 for his work on the co-ordination theory of valency in relation to adjective dyeing; and he is the author of numerous original papers in various branches of chemistry published by the Chemical Society, Society of Chemical Industry, and other societies.

APPLICATIONS are invited for some junior assistantships at the National Physical Laboratory, Teddington. Candidates must possess a good honours degree or equivalent qualification in physics, engineering or electrical engineering, and preferably with some experience in research. Application forms can be obtained from the director of the laboratory. They must be returned to him by, at latest, January 17.

ACCORDING to the New York correspondent of the *Times*, the trustees of the Metropolitan Museum of Art have announced the gift to that institution by Mr. John D. Rockefeller, junior, of 16,000 shares in the Standard Oil Company of California. These shares are worth approximately 200,000*l.* The gift is made unconditionally, but the donor suggests in his letter to the trustees that it should be added to the endowment fund.

ON Tuesday next, January 13, at a quarter past five, Prof. A. Fowler will begin a course of two lectures at the Royal Institution on the analysis of spectra,

and on Thursday, at the same hour, Mr. Julian Huxley will deliver the first of two lectures on the courtship of animals and its biological bearings. The Friday evening discourse on January 16 at 9 o'clock will be delivered by Sir William Bragg on the investigation of the properties of thin films by means of X-rays, and on January 23 by Dr. A. W. Crossley, on science and the cotton industry.

THE third meeting of the Society for Experimental Biology was held at Cambridge on December 19 and 20, the different sessions being held in the Schools of Zoology and Physiology. Members were entertained at lunch in Caius College by Prof. J. Stanley Gardiner, and a dinner was held in Christ's College. The programme included a paper by Prof. J. Barcroft on "Hæmoglobin as an Example of the Evolution of a Chemical Mechanism," a discussion by Dr. H. H. Dale on "The Nature of the Active Substances in the Posterior Lobe of the Pituitary Gland," and a symposium on "The Rôle of Electrolytes in the Organism," in which Messrs. A. J. Clark, J. Gray and J. B. S. Haldane took part. A number of other papers of interest were presented. Fifteen new members were elected.

SIR NAPIER SHAW has published privately a "Kalendar for 1925" arranged in weeks, showing the seasons and the international days for observation of the upper air. This is followed by a detailed list of the daily observations of solar and terrestrial

radiation made in England during 1924. For each day of the year there is shown the sun's declination, the measurement of solar intensity at Kew Observatory between 11h. 30m. and 12h. 30m., the observations at South Kensington and Rothamsted of the maximum intensity of radiation from sun and sky and of the total radiation during the day upon a horizontal surface, and measurements of incoming and outgoing long-wave radiation made at Benson on cloudless evenings. These observations are given in weeks with the unusual but convenient arrangement of giving on each page two weeks which are separated by an interval of six months. The addition and subtraction of observations separated by six months gives the even and odd harmonics of the radiation curve separately. The Kalendar thus contains in readily accessible form much information of great value to meteorologists and others interested in solar and terrestrial radiation.

Two books of ethnological interest are announced for publication by Messrs. Seeley, Service and Co., Ltd., namely, "The Menace of Colour," by Prof. J. W. Gregory, dealing with many of the interracial problems of the day, and pointing out the dangers of the rising tide of colour and how they may be met or avoided, and "Vanishing Tribes of Kenya," by Major Orde Browne, Senior Commissioner of Tanganyika, a record of the habits and customs of the tribes inhabiting the slopes of Mount Kenya.

### Our Astronomical Column.

THE ABSORPTION OF LIGHT IN OPEN STAR CLUSTERS.—Dr. P. ten Bruggencate, in the *Zeitschrift für Physik*, October 31, describes an investigation of the colour indices of stars of the open clusters N.G.C. 1647, of Præsepe and of the Hyades, and deduces that these clusters consist almost entirely of dwarf stars, as is to be expected on the assumption that they have developed from globular clusters and are of great age. Colour-brightness diagrams were prepared, in which the catalogued stars were plotted, and, with certain assumptions as to the value of the parallax, graphs corresponding to the stars of the general stellar system, as determined at the Mount Wilson Observatory, and described by Seares, were drawn on the same diagrams. It was found that in neither case did the stars of the cluster agree with the graph. This was also true of the colour-brightness diagram of the Pleiades, which has already been described by the author.

In the case of N.G.C. 1647, an analysis of the diagram leads to the conclusion that the abnormal distribution of the stars in it is due partly to the assumed parallax being too large, and partly to absorption due to extensions of the dark nebulosity in Taurus, which lies between the cluster and the earth. In the case of the two other clusters and of the Pleiades, there is general absorption due to nebulosity inside the clusters. The Pleiades form a younger cluster than the others, which contains a number of A and F stars, and the nebulosity in it is bright and connected with the bright stars, being formed from material recently given off by these stars, which are in an unstable state of development. In Præsepe and the Hyades the clusters are older, and the internal nebulosity has become dark.

No nebulosity is found in globular clusters which are relatively young, the stars not having reached the stage of development mentioned above; the first sign of instability in these clusters is the occurrence of variable stars. These and the super-giants develop to O type stars and planetary nebulae, and it is to be expected that the remains of these nebulae will be found in old star groups or open clusters.

OBSERVATIONS OF ALGOL VARIABLES.—An important paper by Col. E. E. Markwick (*B.A.A. Journal*, vol. 35, No. 2) contains discussions and light curves of six Algol variables from observations by himself and other members of the Variable Star Section. They are a good example of the useful results that can be obtained in this field by careful and long-continued visual estimations of magnitude. The curves for three of the stars show secondary minima: U Ophiuchi, loss of light at secondary minimum 0.2 mag., RW Tauri 0.2 mag., Z Vulpeculae 0.1 mag. They did not succeed in detecting the secondary minimum of Algol, but the curve of principal minimum is shown in great detail. The total number of observations used is 2630: they begin in 1906 for most of the stars, 1899 for Y Cygni. The period found for Algol is 2.867265 days, which is 3.9 sec. shorter than that given by Chandler. The range of the observations used is 5336 days or 14.6 years. The commencement and end of the principal eclipse are more rounded than those on Stebbins's curve. The effect is to make the total duration of eclipse 14.09 hours, which is longer than is generally given, but Col. Markwick defends his curve on theoretical grounds.