

cause in the slow changes in the eccentricity of the earth's orbit and not in large changes in the obliquity of the ecliptic. This theory also requires the ice ages in the two hemispheres to occur alternately, not simultaneously. It is hard to assess how far these acknowledged changes in the astronomical conditions have been effective, as it is to

judge how far their influence may be needed to supplement all the other meteorological factors operating in past ages. If there is any reason for insisting that the ice ages have run concurrently in both hemispheres, it is far easier to find the cause in the body of the sun than in any peculiarity in the motion of the earth.
H. C. P.

News and Views.

THE report of the Right Hon. W. G. A. Ormsby-Gore, M.P., Parliamentary Under-Secretary of State for the Colonies, on his visit to Malaya, Ceylon, and the Dutch Colony of Java during the year 1928, was presented to Parliament last week. This is the fourth report on Colonial development based on personal tours of the non-self-governing dependencies of the Crown for which Mr. Ormsby-Gore has been partly or wholly responsible. In 1922 he accompanied Mr. Edward Wood (now Lord Irwin) to the British West Indies and British Guiana. In 1924, Mr. J. H. Thomas (then Colonial Secretary) appointed him chairman of the Parliamentary Commission of Inquiry which visited East and Central Africa. Two years later he toured the four British Colonies in West Africa. Reports on each of these tours were presented to Parliament. Each of them is a valuable contribution to our knowledge of the countries coming within the scope of his inquiries. Considered as a whole, they constitute an almost complete summary of the facts related to the geography, history, economic development and administration of most of the countries for which Great Britain has assumed responsibility but to which it has not yet granted complete self-government. The common characteristic of the four reports is the emphasis laid upon the education, public health, and scientific and technical services as factors in the development of the resources of the tropics. Hitherto, there has been a tendency on the part of local governments to regard such services as luxuries to be afforded only in times of their prosperity. This fallacy is dealt with adequately. The scientific and technical services are shown to be the basis of economic advance. The importance of extending the public health services to prevent the enormous wastage of life and loss of physical efficiency of the peoples of the tropics is stressed, but above all it is shown that the work of such services will be largely abortive unless our subject races can appreciate what is being done and can co-operate with us. Hence it is imperative to build up greatly improved education services throughout the colonial empire.

ON his last tour, Mr. Ormsby-Gore took the opportunity courteously offered to him by the Governor-General of the Dutch East Indies to make himself acquainted with the work done by the Dutch in the colony of Java, the most densely populated part of the East Indies. He is thus able to compare Dutch with British colonial administration, and it must be confessed that the comparison does not show up British administration in a favourable light. It would

appear that the Dutch administration has a greater appreciation of the beneficent influence of scientific research than we have. In the island of Java alone there is a Government central research institute at Buitenzorg and several other well-staffed and well-equipped research stations wholly maintained by the industries concerned in different parts of the island. Of the system of agricultural education in force, Mr. Ormsby-Gore speaks with the highest admiration. The public health services are also highly developed, but in this respect the British efforts to combat malaria in Malaya are warmly commended. The whole report is worthy of the closest scrutiny, and we hope to discuss it in detail in later issues of NATURE.

A MEMORANDUM has recently been issued by the New International Association for Testing Materials (N.I.A.T.M.) concerning the present position and activities of the Association and some recent decisions arrived at by the permanent committee of the Association held in Paris on June 21 last. The main object of the Association is to hold periodical congresses, but experience has shown that it is not satisfactory at a single congress to discuss subjects concerning the whole range of the testing of materials. It has therefore been decided to confine attention at each congress to a relatively small number of specially important subjects in each of the sections. On the other hand, undue specialisation in international discussions is to be avoided. To solve the task of selecting subjects for the next congress, to be held in Zurich in 1931, all participating countries were asked to forward suggestions. Sixteen countries have responded, and the outcome of their suggestions is an invitation to each country to prepare a number of preliminary summary reports on a small number of selected subjects and to appoint reporters. It is proposed to publish these preliminary reports early in 1930, in either English, French, or German. When the permanent committee receives these preliminary reports it will be in a better position to consider the final selection of subjects for the congress of 1931. The British committee, the offices of which are at 28 Victoria Street, S.W.1, is taking steps to secure widespread membership among those interested in the testing of materials, and it is anticipated that Great Britain will be adequately represented when the reports are published by the International Association.

MR. BHUDEB MOOKERJI, who has recently published the first two volumes of his work entitled "Rasa-Jala-Nidhi" or "Ocean of Indian Chemistry and Alchemy," has now issued a pamphlet entitled "Indian

Civilisation and its Antiquity" (41a Grey Street, Calcutta; price 2 rupees). He treats the subject under three heads, namely, phallism and the spread of Indian culture, the gypsies and the spread of Indian culture, and Indian chemistry and its antiquity. Mr. Mookerji has clearly lavished much effort upon his theses, but both his natural science and his etymology are, to say the least, heterodox. He says, for example, that Darwin's theory "is no longer accepted by the most distinguished of the modern scientists and philosophers," Dr. Martineau and others having proved it to be untenable "and established its utter worthlessness by a volley of irrefutable logic." As to the date of the origin of Indian civilisation, Mr. Mookerji places this about 1950 million years ago. Sir James Jeans estimates the age of the earth itself at only 50 million years more, so that we are bound to agree with Mr. Mookerji's own disarming statement that "this will appear incredible to many people." Still, in spite of exaggerations of this kind, the author has managed to make out a case for the respectable antiquity of Indian chemistry, and the pamphlet should be examined by historians of science. The sources of Rhazes' chemical knowledge are considered at some length, Mr. Mookerji giving several reasons for believing that Rhazes was indebted to the Indians for his knowledge of the chemistry of metals. If we might make a suggestion, it is that Mr. Mookerji should associate himself with some European scholar trained in the methods of historical criticism; the collaboration would probably produce interesting and valuable results.

At a meeting of the Royal Statistical Society on Dec. 18, Mr. H. E. Soper, of the National Institute for Medical Research, read a paper on the interpretation of periodicity in disease-prevalence. Amongst the various theories put forward to account for epidemic recurrence, the most favoured presents a picture of a rise and fall in the new cases of a contagious disease as consequent upon a glut and dearth of susceptible persons; the action may be supposed to go after the manner of a pendulum, where, as the energy of flow becomes exhausted, the energy of potential activity gets stored up, to be released again when motion recommences. The stored energy is the accumulation of susceptible children, by birth. This view of the origin of the surgings of measles epidemics has been carried now a little beyond that already reached by the investigations of Sir William Hamer. A simple supposition in regard to the delayed or lapsing infectivity of an infected person, combined with a constant inflow by birth of susceptible children, leads, by invoking the statistico-chemical law of mass-action, to a periodic wave, the period of which can be interpreted. These idealised waves do not, however, give a very true replica of the curve of monthly cases of measles as presented by an actual chart. Curves very similar to the actual curves of measles cases in Glasgow would be the foreseeable consequence of combining the natural epidemic swing with a forced seasonal impulse of a certain form, the maximum of which coincides with fair truth with the time of assembly of schools after the summer vacation.

In the early days of electrical distribution the only source of revenue was the lighting load. As the amount of plant required depends on the maximum demand at any particular time, it was necessary to instal expensive storage batteries if the capital cost was to be maintained low. The high price charged for the lighting service was due to the poor use made of the capital invested. In order, therefore, to encourage consumers to provide a load during the period when there was little demand for lighting, energy for motors and for cooking and heating was offered at a low price. Complicated tariff systems of charging have been devised with the object of encouraging consumers to use electricity at times when the demand is small. For various reasons, however, these have not proved attractive. In a paper read to the Institution of Electrical Engineers on Dec. 7 by W. Holmes, stress is laid on the importance of encouraging consumers to store thermally the energy they receive during the slack periods of the day, the house being heated and supplied with hot water continuously. Several electric companies offer to supply current for this purpose at very low rates. By suitable electric devices the current is switched on and off automatically at any desired times. Recent tests show that the electric hot-water storage tank is wonderfully efficient. A domestic thermal storage cylinder will retain its useful hot water for more than a week after the supply is switched off. A 100-gallon storage tank takes 50 units to heat it from 42° F. to 212° F., and the efficiency of the conversion from electrical energy to heat is more than 99 per cent. On a 24-hour basis the efficiency is about 94 per cent, with a capital cost of £60, and a life of above thirty years. As more than 50 per cent of the revenue of electric stations comes from the domestic load, an increased demand for electric heating would enable them to reduce substantially their charges.

THE report by a committee of the Illuminating Engineering Society on the progress made in electric lamps, which appears in the Society's *Journal* for December, is instructive, as it shows the large reductions that have been made during the last ten years in the cost of lighting. The report of the Electricity Commissioners shows that the average revenue per unit sold by supply companies for domestic purposes has fallen 33 per cent during the last ten years. The reduction of the price to the consumer is due partly to the reduction of the price per unit. For example, the Metropolitan Borough of Hampstead now charges only 3d. per unit for lighting. It is largely also due to reductions in the price of electric lamps and their increased efficiency. These two factors result in a great increase of candle-power hours for the same expenditure in lighting. Gas-filled lamps are now replacing the less efficient vacuum lamps, as their price is practically the same, and obscured lamps, which avoid glare, are replacing clear lamps for general lighting. Numerous small lamps are used for lighting rooms instead of a few large lamps. In particular, there is a considerable demand for lamps rated at 15 and 25 watts. In the opinion of the committee, the

further co-operation of architects in arranging the lighting of houses is desirable. Very few houses are equipped with wall plugs to which standard lamps can be connected. The committee thinks that surfaces lighted either by reflection or by transmission through diffusing media are definite architectural elements in the design of a dwelling-house.

WHEN we consider what is happening in various countries in connexion with their broadcasting services, we have reason to be satisfied with that in Great Britain. In the *Canadian Magazine* for September last appears an interesting paper by D. H. Copeland and P. Dorté entitled "A Radio Voice across the Land." They state that broadcasting in Canada is now almost in a state of chaos, and that a remedy is urgently needed. It seems that there is not a single broadcasting station in operation either in the United States or Canada which exists purely for the purpose of entertaining the public. All of them have ulterior motives, self-interest being the mainspring of the broadcasting industry. Advertising is only one of the ways in which this is expressed. An official of the National Broadcasting Company of New York has recently stated that the activities of the company have resulted in a loss of half a million dollars, and yet it is still apparently flourishing. The authors give as the reason that the company is associated with the Radio Corporation of America, and that the sale of millions of dollars' worth of apparatus has been greatly to its benefit. Advertising by radio is now a fine art, and it pays well. The public associates the name of the advertiser with the excellent entertainment he provides. The authors discuss whether it would be advisable to inaugurate a new system. They consider that the English system would be inapplicable in Canada. If a key station was made in Toronto and began its programme at eight o'clock in the evening, it would be received at Winnipeg at six o'clock, in the foothills of the Rockies at five o'clock, and on the west coast at four o'clock. A key station at Toronto would not be welcomed at Montreal. The language difficulty is a real one. Increasing the tax on broadcast reception would cause political difficulties, and the question of compensating existing broadcasting companies would be serious. They suggest having two main stations, one in eastern and one in western Canada, with an associated train of relay stations. The main difficulty is the financial one, and they state that the only solution appears to be a sound, business-like development of the advertising field.

THE December issue of the *Scientific American* contains major articles dealing with a great variety of scientific topics, from the surgery of the early Egyptians, the biology of Dominica, a study of the bladderwort, a petrified forest near San Francisco, to the practical themes of hydro-electric aqueducts of wood, the anti-efficiency influence of noise, the economic development of Canada, unique methods of dam construction, and many more. These articles are of a high standard, written for the general reader, yet comprehensive in scope, and accurate and up-to-date in their information. In addition to the longer articles there are close on a hundred minor notes containing

all sorts of odds and ends of scientific news. No British magazine fills the place of the *Scientific American*, and part of its attraction lies in the number and character of its illustrations. To take the biological side alone, there are reproduced a prehistoric scene in Mongolia, by Miss Alice Woodward, illustrating some discoveries of Chapman's 1928 expedition to Central Asia; Charles Knight's new paintings, presenting the evolution of life, from the Field Museum in Chicago; photographs of petrified trees in California; of Dominican animals; of Canada's herds of bison and reindeer; and half a dozen drawings of the bladderwort. That a magazine of such a stamp can be produced for 35 cents and can boast that it is in its eighty-fourth year of issue, gives some indication of the number of Americans generally interested in scientific things.

AN exhaustive article on 'sleeping sickness' is contributed to the December number of *The Nineteenth Century* by Dr. Lyndhurst Duke, formerly chairman of the League of Nations Commission on Sleeping Sickness. This disease, which has been prevalent in Africa but is now largely controlled, is conveyed by species of biting flies, the tsetse. Dr. Duke's remarks on the relation of the big game to the disease are of special interest. As the game recedes into the wilderness the tsetse, which feeds upon it, has either to retreat with it or to adopt a new food supply. "Wherever man is seriously drawn upon by game-tsetse for food, sleeping sickness will be found; but where the primitive balance between man and the game persists, the disease is either exceedingly rare or absent altogether. . . . When man appears in sufficient force to establish himself successfully his presence inevitably drives away the game. From the biological point of view, therefore, man is not likely to serve as an essential food animal for the game-tsetse, except perhaps for relatively short periods during the retreat of the game before advancing human settlement."

IN the Hancock Museum in Newcastle and its collections, the north of England, as well as the Natural History Society of Northumberland, Durham, and Newcastle-upon-Tyne, possess a valuable heritage. The report of the Council for 1927-28 indicates that the Museum is appreciated locally, for close upon 22,000 persons visited it during the year, and a very encouraging response was made to the appeal of the president, Viscount Grey, for a sum of £1500, to aid in the upkeep and improvement of the building and its fittings. Actually £694 was collected, and £480 promised still remains to be garnered, but it is clear that an excellent opportunity of subscribing still awaits those who have forgotten to send their donations. The council appears to have made good use of the funds it has received, and it is encouraging to note that the membership of the Society, which, next to interest on investments, forms the mainstay of the upkeep, shows a moderate increase. The accounts printed with the report do not, curiously enough, give any statement of the capital sums from which the main revenue is derived.

THE autumn issue of *The Fight against Disease*, the quarterly journal of the Research Defence Society,

contains a review by Sir Leonard Rogers of the Report of the Vaccination Committee of 1928. This article supplies the public with a clear and reasoned statement in regard to the present-day problem of vaccination. Before the Act of 1907, which rendered it much easier to obtain exemption, somewhat more than half the children born were vaccinated. Afterward the proportion vaccinated fell, reaching a minimum of 25 per cent in 1920. With a *sixty-six fold increase* of smallpox in England and Wales in the six years to August 1927, the proportion vaccinated has risen again to 33 per cent. Smallpox is once more very prevalent (there were 15,000 cases in 1926-27 in England and Wales) and appears to be on the increase. Fortunately, the type is mild and mortality low, but, as Sir Leonard Rogers points out, the disease is subject to sudden variations in severity, and no one can foretell the continuance or otherwise of the present mild form.

PREHISTORIC toothache is yielding its secrets to modern investigation. The Museum at Los Angeles contains more than a thousand jaws of the sabre-toothed tiger from the asphalt pits of Rancho la Brea, and although few of the jaws retain their full complement of teeth, sufficient remain to yield interesting results to X-ray examination. Caries has not been found in the sabre-tooth jaw, although there are many teeth which are much worn. Pyorrhœa is probably present, but rare. Impaction, the bane of modern 'wisdom tooth' sufferers, is clearly shown in some of the jaws, as well as alveolar abscesses. Dead teeth occur, always blackened, in which the root canal is filled in, and in some cases the root has become bulbous and acquired excessive growths.

THE annual report and statement of accounts for the year 1927-28 of Livingstone College, Leyton, has been received. The College gives elementary medical instruction to missionaries in order that they may better care for their own health and that of the people among whom they work when far from qualified medical aid. The College is largely dependent upon donations and subscriptions, for students' fees do not nearly cover current expenses, and further help of this kind is urgently needed.

THE Royal College of Surgeons of England has issued a "Catalogue of Manuscripts" contained in its Library, compiled by the Librarian to the College, Mr. Victor Plarr. It records the titles or the descriptions of all written documents in the College Library, with the exception of the John Hunter Manuscripts, which have already been set out in Bailey's "List" published in 1891. The chief treasures indexed in this Catalogue are the manuscripts and letters of Clift, Cooper, Lister, Owen, Paget, Quekett, Home, and Jenner.

THE Ministry of Health has issued a memorandum on the accommodation for the sick provided at certain public schools for boys in England, compiled by Capt. W. Dalrymple-Champneys (London: H.M.S.O.). The first part of the memorandum surveys the existing sick accommodation provided at a number of well-known public schools. In the second part, the prin-

ciples that should guide schools in extending existing, or providing new, accommodation are considered, with illustrative plans; this should be of considerable service to school authorities.

THE Survey of India has begun the issue of a new series of publications, which will describe the work of the Geodetic Branch, excluding the work of the Drawing Office (Survey of India: Geodetic Report, Vol. 1; Dehra Dun, 1928; six rupees, or 9s. 9d.). The geodetic work was formerly published in the series of *Records of the Survey*, which also dealt with topographical work. This first volume of the new series covers three seasons, 1922-25, but future volumes will deal with only one season's work. The volume covers a wide range of subjects—levelling, gravity and latitude, tidal observation and prediction, magnetic field and observatory work (which were much reduced during the period), and solar photography, since discontinued.

THE Buchan Prize of the Royal Meteorological Society for 1929 has been awarded to Dr. Harold Jeffreys for papers contributed to the *Quarterly Journal* of the Society during the years 1924-27 on cyclones, fluid motions produced by differences of temperature and humidity, dynamics of geostrophic winds, and other subjects. The medal will be presented to Dr. Jeffreys at the annual meeting of the Society on Jan. 16.

THE November issue of the *British Journal of Actinotherapy* (vol. 3, No. 8) contains a full summary of the papers read at the recent International Conference on Light and Heat. There are also original contributions by Prof. Leonard Hill and Dr. Katherine Spence, abstracts from recent literature, and the first of a series of articles on the scope of actinotherapy in general practice by Dr. Annandale Troup.

APPLICATIONS are invited for the following appointments, on or before the dates mentioned:—A visiting teacher of house painting and decorating, at the L.C.C. Camberwell School of Arts and Crafts—The Education Officer (T.1.a.), County Hall, Westminster Bridge, S.E.1 (Jan. 4). An instrument maker at the Bradford Technical College—The Principal, Technical College, Bradford (Jan. 12). A lecturer in engineering (Grade I.) for the subjects of electrotechnics, mathematics, machine construction and drawing, etc., in the Technical College, East London, South Africa—The Secretary, Office of the High Commissioner for the Union of South Africa, South Africa House, Trafalgar Square, W.C.2 (Jan. 14). A keeper of the department of vertebrate zoology of the Liverpool Museums—The Director, Free Public Museums, William Brown Street, Liverpool (Feb. 10). An assistant lecturer in chemistry at Battersea Polytechnic—The Principal, Battersea Polytechnic, S.W.11. A resident lecturer in mathematics in the Church of England Training College, York—The Principal, Church of England Training College, York. An assistant in the mechanical engineering section of the engineering department of the Municipal Technical College, Halifax—The Principal, Municipal Technical College, Halifax.