

form free from the objections raised by German critics: there can be little doubt that Ramsey would have returned to this subject and further developed it. He has written on 'universals' in *Mind* (Oct. 1925), and on mathematical logic in the "Encyclopædia Britannica" and elsewhere. Two papers in the *Economic Journal*, on the mathematics of taxation (March 1927) and of saving (December 1928) must be mentioned, on account of the high praise bestowed upon them by economists competent to judge.

This scanty list reveals the bent of Ramsey's mind. As a student he proved himself a mathematician of exceptional gifts, but his interest and strength lay in the application of mathematics to problems of philosophy or economics. His main interest was in the very difficult boundary region between mathematics and logic: in this he was already recognised as an authority. For a truer appreciation of him as a man we must turn to his contemporaries, his friends and colleagues. To them, Frank Ramsey seemed to tower over his fellows intellectually even as he did physically—for he stood 6 ft. 3 in. or thereabout and was of unusually sturdy build. What Ramsey might have achieved, how grave the loss to learning in his untimely death, they cannot tell; but the memory of a friend who combined unrivalled powers of mind

with an unassuming simplicity of manner and character will remain.

Ramsey married in 1925, Miss Lettice Cautley Baker, and leaves two daughters. At the end of November he was attacked by influenza, the ill-effects of which persisted. At length an operation was judged to be inevitable, and after it he died.

WE regret to announce the following deaths:

Prof. Charles Julin, member of the Belgian Royal Academy of Sciences and formerly professor of comparative anatomy in the University of Liège, known for his work on the morphology and embryology of the Tunicates, on Feb. 5, aged seventy-three years.

Dr. E. D. Roe, Jr., director of the observatory and for twenty-nine years professor of mathematics at Syracuse University, known for his interest in pure mathematics, the testing of objectives and double stars, on Dec. 11, aged seventy years.

Prof. Eduard Study, emeritus professor of mathematics in the University of Bonn, author of works on the geometry of dynamics, on ternary forms, spherical trigonometry, orthogonal substitution and elliptic functions, on Jan. 6, aged sixty-seven years.

Prof. A. V. Vasiliev, of the Universities of Kazan and Leningrad, who was distinguished for his work on the theory of numbers and mathematical philosophy and was instrumental in establishing the Lobachevski prizes for works on non-Euclidean geometry and mechanics, on Oct. 6, aged seventy-six years.

### News and Views.

RATIONALISATION, especially in reference to the chemical industry, was the subject of a paper by J. Davidson Pratt, general manager of the Association of British Chemical Manufacturers, read at the University of Bristol on Feb. 6. The general principle that exact knowledge should be the basis of industrial policy was most clearly stated: and of course the principle is in practice recognised more generally in the chemical than in other industries. Imperial Chemical Industries and the German I. G. are well known. Chemistry involves so obviously the problem of research and co-ordination of results that the tendency to large scale and long range thinking in the industries dependant upon a knowledge of chemistry can scarcely be resisted. Mr. Pratt was in fact preaching to the converted. But the conversion, as he pointed out, has not gone far enough. Besides the important issues with which he dealt there are others. National 'rationalisation' on the basis of amalgamation or association of firms gives the group so united a great *political* influence, which in practice has been used for the introduction of protective tariffs and the maintenance of high prices within the tariff-wall. It is quite useless to say that the consumer should not suffer. He will, unless policy prevents it, and the policy of a national amalgamation in any trade is never in favour of the consumer at home, unless competition is feared from abroad. But even international agreements may be aimed only at keeping prices up.

In Great Britain, however, we have still a long way to go towards standardisation and amalgamation in most industries before any danger to the consumer

need be feared. For example, the coal industry seems still to be thought of, even by its reformers, as a separable industrial unit. But would not true rationalisation be based upon the *uses* of coal, not the mere getting of coal? Chemistry has scarcely been used by those who have controlled the policy of coal-getting. They have provided productive industry and the private consumer with primitive lumps of a natural product and given no attention to research either for power supply or for by-products. If one may venture upon political issues, neither the Samuel Report nor the present Government's Coal Bill has envisaged the chemical connexions of coal. The whole industry is pre-scientific. The chemists have still a large field to enter, outside what are called the chemical industries. The danger, indicated but not emphasised by Mr. Pratt, is that the financier and industrialist will not go far enough in the application of scientific knowledge and the promotion of research. It is very tempting to 'rationalisers' to be satisfied with a collection of meaningless statistics as to existing processes or methods.

NEVER before in the history of the world have greater or more momentous issues presented themselves in the political sphere than those which now confront us. Even the greatest of all at any time, that of peace or war, though not now a direct or immediate issue, can never be far away but lurks as a sinister phantom in the background. There is thus the greater need on the part of the electorate in any democracy for intelligent apprehension of the many difficult and intricate political problems which call so urgently for solution—and the political here neces-

sarily includes the economic. The trouble hitherto has been that everyone feels himself competent to discuss and even to decide weighty matters in this field without knowledge or trained habits of thought. Ignorance, shallowness, prejudice, and, above all, garrulity, reign supreme. No wonder the scientific mind turns from politics in disgust, and this is a thousand pities; for, as we have frequently urged, there is plenty of scope for the scientific habit of close, concentrated, creative thought.

AMID the vast mass of political writing and speaking which deafens and confounds the modern ear, one has to proceed with discriminating caution. It will frequently be necessary to rule out and refuse to take too seriously the political diatribes of the daily Press, in view of the conditions under which these are produced. The monthly reviews are sometimes helpful, but despite the profusion of our periodical literature, it yet seemed that there remained room for a monthly or quarterly review devoted solely to the political field, forming a platform for serious and well-informed students of politics. So far as one can tell from the first number of the new review, *The Political Quarterly*, published by Messrs. Macmillan and Co., Ltd. (price 3s. 6d.), and controlled by a very competent editorial board, it seems reasonable to hope that we have here a guide, counsellor, and perchance a friend, amid the thorny mazes of politics. The first number is well balanced and contains several concisely written and authoritative articles, book reviews, and surveys of current affairs. Alfred Zimmern's "Democracy and the Expert" should prove of considerable interest to men of science, who will also appreciate the attempts made to interpret the large amount of real experimental research and its results now undertaken in the social and political sphere. The new review takes a progressive point of view and intends to act as a medium of constructive thought.

SUBSTANTIAL progress is now being made with the grid of 132,000-volt overhead wires which will ultimately connect together all the large and efficient electric stations in Great Britain. Up to the end of last year, about sixty miles of the system had been completed, but before the end of this year there will be nearly a thousand miles of the system in operation. The principal main line so far constructed extends from Greenock through Glasgow to Bonnybridge. It includes high level crossings over the Cart and the Clyde and the extension to Dundee crosses the Forth and gives a clearance of 100 feet above high-water level. The problem of supplying consumers in small villages and farms has not yet been satisfactorily solved. The 33,000-volt lines already in operation in several districts have given little trouble even during the exceptionally stormy weather that has occurred recently. Strawblown from stacks has occasionally short-circuited the insulators, and the sea salt deposited on the line insulators near the coast has in a few instances caused them to flash over. In Ayrshire the lines have been struck directly by lightning on several occasions, but beyond opening the automatic switches little difficulty has been caused. It is important that children should

be taught in schools the nature of conductors and insulators of electricity. Possible dangers arising from high pressure conductors should also be pointed out. In America there has been at least one fatality due to the wire of a kite flown by a boy nine years old coming into contact with a high pressure overhead wire. A damp string in similar circumstances might conceivably be dangerous.

In a paper read to the North-East Coast Institution of Engineers and Shipbuilders on Feb. 7, Mr. S. Cook discussed the value of high pressure steam for marine work. The significance of the term high pressure steam has changed with each succeeding generation of marine engineers. At one time, even 15 lb. or 20 lb. per sq. in. was considered high pressure. In early days, some of the foremost engineers declared against the use of high pressures, the theory not being understood. Then, too, faulty construction often led to trouble. To-day, 200 lb. per sq. in. may be regarded as a standard pressure at sea, though some ships are using steam at 300 lb. or 400 lb. per sq. in. pressure, while the Clyde steamer *King George V.* has run successfully for three seasons with a boiler pressure of 550 lb. per sq. in. and steam superheated to 750° F.

INCREASES in thermal efficiency can be obtained by raising the pressure or temperature, and by means of tables Mr. Cook set out the effect on thermal efficiency due to (1) superheat only, (2) increase of pressure only, and (3) increase of pressure and temperature. From the tables it was shown "that an increase of temperature at 200 lb. per sq. in. by superheating to 750° F. increases the efficiency from 31.9 per cent for the saturated condition to 34.0 per cent for the higher initial temperature. Whereas if this increase of temperature is accompanied by an increase of pressure to 1000 lb. per sq. in. the efficiency is increased from 31.9 per cent to 39.8 per cent, a total improvement of 25 per cent, the greater part of which is due to increased pressure." In touching upon the type of boiler, the quality of the feed water, the design of condensers, and other practical matters, Mr. Cook made the interesting statement that, in spite of the high pressure in the *King George V.*, in three and a half years it had not been found necessary to remake a single main steam pipe joint.

THE issue of the *Journal of the Society of Chemical Industry* for Jan. 24 contains an interesting illustrated article by Sir Robert Hadfield, T. G. Elliott, and R. J. Sargent on recent developments in corrosion and heat-resisting steels. They give a good historical account of the development of stainless chromium steel, in which the work in France from 1876 onwards, the discovery by Brearley in Sheffield in 1912 and after that this steel could be hardened, tempered, and polished for use in making stainless cutlery, and other investigations are reviewed. Sir Robert then points out that his firm is now collaborating with the Fourchambault Co. in France and the Midvale Steel Co. of Nicetown, Pa., in the development of a series of heat-resisting steels. These are of two types, those which are hardened by quenching and those which are softened. In the former, chromium is practically

the only alloying element, and by varying the amount of carbon the steel may be made to range from a soft material suitable for stamping into dishes and pans to a hard steel suitable for knife blades. The best corrosion resistance is obtained with somewhat higher chromium percentages, namely, 17-18, than the 12.5-14 formerly used. A steel with 17 per cent or more of chromium and 7 per cent or more of nickel is not hardened by quenching and has superior corrosion resistance, although it is more expensive. The article gives many details of the structures, resistance to acids, etc., of these steels, and also of their industrial applications, including furnaces and operations involving high temperatures and pressures.

A PROPOSAL to excavate the Roman city of Verulamium was considered at a meeting of the St. Albans City Council on Feb. 4, when the Parks Committee presented a report which had been made by Dr. R. E. Mortimer Wheeler on behalf of the Society of Antiquaries at the request of the Mayor. The report stressed the importance of Verulamium, first as one of the great tribal capitals of prehistoric Britain, and secondly as one of the great centres of Roman Britain, which grew up as a city of the first rank a century or more before London was even founded. It appears to be the only city in Roman Britain which attained the rank of a *municipium*. Dr. Wheeler suggests that the examination and consolidation of the better preserved stretches of the Roman defences should be given precedence. These defences consist of a magnificent ditch, unequalled in Britain, a level platform or berm, behind this a wall of flint-rubble with bonding courses of brick, and a broad and high bank piled against the inner side of the wall. The wall is at present in some danger from the weather and the disintegrating action of ivy and tree-roots. When the defences have received attention, it is suggested that the plan of the town should be revealed and the principal buildings located. The Council decided to appoint a committee for this work to which the Society of Antiquaries and the St. Albans and Hertfordshire Archaeological Society would be invited to appoint representative members.

A PAPER was read on Jan. 27 by Prof. R. A. S. Macalister and Prof. J. K. Charlesworth before the Royal Irish Academy dealing with the archaeological finds at Rosses Point, Sligo. The announcement of the discovery of these implements was first made by Mr. J. E. P. Burchell in *NATURE* of Aug. 20, 1927, p. 260. An energetic discussion followed, during which directly opposing views were expressed, even by archaeologists who accepted the human origin of the implements. The geological evidence is almost unanimously opposed to the possibility of palæolithic implements being found in this particular part of Ireland. Profs. Macalister and Charlesworth expressed the opinion that until archaeologists can reconcile their own differences, and find some means of squaring their conclusions with those of geologists, there is nothing to be gained for science from these implements.

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SIR DOUGLAS MAWSON'S Antarctic expedition has returned to Kerguelen to coal the *Discovery*. It is now too late in the season to allow further exploration within the area of pack-ice. Reports to the *Times* summarise the season's work. The edge of the land has been outlined between long. 44° E. and 66° E., including Enderby, Kemp, and MacRobertson Lands. Farther east as far as 90° E. the position of the continental margin has been indicated by soundings. Much of the new coast line is fringed by ice cliffs. The ice sheet is pierced by many rocky nunataks, and several definite mountain ranges have been charted, of which the principal is Scott Range in Enderby Land. It has about 200 peaks, occasionally rising to 7000 feet, and some of these have been fixed. From the rock collections on the coast, islets and from the dredge there is every indication that this part of Antarctica is built of ancient crystalline and early sedimentary rocks. Much oceanographical work has been done with the sonic sounder and deep sea water-bottle. This is probably more detailed than any previous expedition has been able to do. High-level meteorological observations show that at 5000 ft. the principal air currents are from the north-west to south-east. The strong gales off Enderby Land are from the east or north of east, and not from the south-east as they are in Adelie Land and elsewhere on the plateau coast. The pack-ice is thus driven to the west or south of west, and the coasts of Enderby and Kemp Lands are kept comparatively clear except for the impediment offered by great rows of bergs, from farther east, stranded in the shallow water of the continental shelf. East of Kemp Land there is much pack, reminiscent of the heavy ice of the Weddell Sea.

A SHOWER of fishes from the sky might be reckoned one of the classic stories of anglers, were it not that abundant evidence exists of this natural phenomenon. Dr. E. W. Gudger, who on two previous occasions has recorded the results of his investigation of falling fish records, returns to the subject in the December *Scientific Monthly*. In all, he has found about seventy-one accounts, more or less well authenticated, of rains of fishes extending from A.D. 300 up to the present time, and in space encircling the whole globe. He adds one or two new records: in May 1900, at Rhode Island, when boys gathered and sold fishes by the pailful, and in May 1928, when hundreds of small fishes were deposited on a newly planted cotton plot at Tarboro, in North Carolina. Of course, the explanation of the fish rain is the same in every case. High winds, particularly whirlwinds, pick up water, fishes and all and carry them inland, and when the velocity of the air and clouds becomes relatively lowered, the fishes fall to earth.

IN view of the serious aspect which the slaughter of whales for commercial purposes has assumed, it is significant that the economic extinction of whales falls to be recorded from a new area. For the second time in history there are no longer sufficient whales along the Californian coast to support a whaling industry (*California Fish and Game*, p. 337; Oct. 1929). In 1865 there were eleven whaling stations on the coast

of California, and a considerable fleet of ships was employed in the industry. Writers often mentioned seeing fifteen whales at one time in one place, and in 1853 it was estimated that fully 30,000 Californian grey whales visited the California coast annually. By 1880 the decline in whaling was noticeable; by 1890 practically no whaling was possible along the coast. Then in 1919, with the gun-harpoon and speedy ships with a hundred-mile radius, commercial whaling again began in Monterey Bay. In the new operations, as was to be expected, only four or five California grey whales were killed, but 781 hump-backs were secured within three years. Now the hump-backs also have been reduced below the economic level. In less than ten years of operation, the Moss Landing whaling station has been dismantled and operations abandoned because of lack of whales. It is a fortunate thing that demand is not sufficient to endanger still more the surviving breeding stock. No laws have been enacted in California to curtail the catch or otherwise to protect whales.

In his Friday evening discourse on "Diving" delivered at the Royal Institution on Feb. 7, Prof. Leonard Hill showed and described the new submarine escape dress which has recently been tested by the Admiralty. He also showed a new self-contained diving dress with an injector for circulating the air in the helmet through soda lime and worked by the feed from a cylinder of oxygen and air. With this dress the diver is independent of hose pipe, and can detach and fix his life-line containing telephone wires, and proceed with a distance line into a wreck. The danger of oxygen poisoning has to be met by suitable concentration of oxygen in the air supply, and fixed periods of work at various depths. The decompression of divers by the new submersible decompression chamber of Mr. R. H. Davis was dealt with and the use of oxygen for washing nitrogen out of the body, so halving the present times for decompression, was discussed. Speaking of the danger of oxygen poisoning, Prof. Hill suggested that air containing only 10 per cent or even 5 per cent of oxygen should be used for deep work at say 300 ft., the diver enriching the air he breathes with oxygen while climbing up, and then breathing pure oxygen on entering, at 66 ft., the submersible decompression chamber and while being decompressed in that chamber. By such means diving at 300 ft. or even 350 ft. can be made safe.

MR. REIJIRO WAKATSUKI, the chief Japanese delegate to the Naval Conference, spoke to the people of Japan on Feb. 9 by Marconi beam telephony from the Imperial and International Communications Marconi Beam station at Dorchester, his speech being relayed throughout Japan by means of the Japanese Broadcasting Company's stations. The wireless telephony apparatus designed by the Marconi Company was connected to the beam telegraph aerial used for telegraphy with Japan, and reports received indicate that the transmission over the great distance separating the transmitting and receiving stations was very satisfactory. The incident is noteworthy because it was only six years ago that Marconi first transmitted in-

telligible speech to Australia, and the evolution of the system of combined telegraphy and telephony on the beam aeriels marks the progress which has been made in transmission over long transcontinental distances.

It is announced by the Hague correspondent of the *Times* that on Feb. 10, M. Reimer, Minister for Dykes and Waterways in Holland, opened the first pumping stations for the draining of the Wieringen Polder, the first of the polders to be completed in the scheme for the reclamation of the *Zuider Zee*. One station is at Den Oever at the north, and the other at Medemblyk at the south of the polder, and about eight months will be required to free the polder of water. The project for the enclosure of the *Zuider Zee* was described in an article in *NATURE* of Sept. 21, 1929, by Dr. Brysson Cunningham. The Wieringen or North-west Polder, with an area of about 50,000 acres, is the smallest of the four polders contemplated. When the whole of the reclamation work is completed, it is estimated that more than half a million acres, or about 10 per cent of its present area of arable land, will be added to Holland. The enclosed area will not, of course, be immediately available; it is considered that six or seven years must elapse before it reaches its full cultivable value.

VARIOUS agencies tend to an improvement of the condition of urban atmospheres. None can be more welcome than the action of the Royal Institution of British Architects in issuing a report on smoke abatement (price 1s.). The widespread damage to buildings has convinced the architects of the need, and they have much—sometimes all—of the responsibility for choosing the appliances for consuming fuel in domestic and other buildings. There can be little doubt that if architects as a body strive to prevent the introduction of smoky appliances into buildings, considerable amelioration should in time follow. The report gives an account of the law as to atmospheric pollution. Technical information as to the effects of smoke and sulphurous impurities on buildings is given, and recommendation as to the choice of fuel and heating systems. Little exception can be taken to the technical contents, but here and there appear signs that no one on the Committee had first-hand knowledge of fuels. Still, the report is for architects, not fuel experts.

THE fourth annual report for 1929 of the Pharmacological Laboratories of the Pharmaceutical Society of Great Britain indicates that the time of the staff was divided between research work and the examination of samples submitted by manufacturers. Some of the problems investigated were suggested by the revision of the "British Pharmacopœia". The director, Dr. Burn, working with Prof. Bijlsma and Dr. Gaddum, has found that the oxytoxic value of a pituitary (posterior lobe) extract does not necessarily indicate its pressor or antidiuretic activity: each property must be assayed separately. The pressor principle has antidiuretic activity and also inhibits the fall of blood-sugar produced by insulin. Examination of samples of strophanthin by Mr. Wokes

indicated that the average activity was only  $60 \pm 15$  per cent of the international standard ouabain: the strength of commercial tinctures of strophanthus was found by Dr. Burn to be about equal to a 0.42 per cent solution of the standard ouabain, the majority lying between 0.31 and 0.53 per cent. Dr. Barbagosè has investigated the toxicity of samples of tetraiodophenolphthalein, the determinations being carried out by intravenous injection into the tail vein of mice: the criterion used was the death of half the animals within three days. The toxicity was found to vary from 0.27 mgm. to 0.37 mgm. per gm. mouse. Dr. Coward, who is in charge of the nutrition department, has carried out a number of investigations on different vitamins. With Key and Morgan she has obtained evidence of a new growth factor for the rat, which is found in certain samples of casein, in fresh milk, lettuce, fresh and dried grass, beef, liver and wheat embryo, but is absent from dried yeast and butter. Its presence is essential in the synthetic diets used for assay of vitamins A or B. Dr. Coward has also found that cod-liver oil contains from 50 to 150 units of vitamin D per gm., butter 0.8-1.0 unit per gm., milk 0.2 unit per gm. as a maximum, and irradiated milk from 0.1 to 2.0 units per gm. The staff of the Laboratory together with attached workers, published seventeen papers during the year.

AMONG the contributions contained within Vol. 11 of *Nauka Polska*, 1929 (*Science and Letters in Poland*, an annual publication edited by Prof. S. Michalski) mention may be made of Prof. Paul Rybicki's communication on "Learning in Relation to Social Life; Some Borderline Problems of Sociology and the Theory of Learning" and that by Prof. S. Ciechanowski, which gives an account of the position and needs of medical science in Poland. The former article contains a close study of the subject, such as might be expected from so thoughtful a scientific worker as Prof. Rybicki, whilst the latter is especially significant since it was only last spring that an important medical congress was held in Warsaw. The considered views which Prof. Ciechanowski now publishes indicate the lines upon which he believes Polish medical science should advance. In this volume, too, Dr. M. Loref announces the results he has obtained from some searches into ancient archives for information concerning the Polish scholars in Italy and at Rome during the sixteenth, seventeenth, and eighteenth centuries. A survey of scientific thought abroad is also included in *Nauka Polska*, and it is interesting to note that lectures recently delivered by Prof. R. A. Millikan ("Science and Society"), Sir James Ewing ("A Century of Inventions", *NATURE*, 121, 947; 1928) and Prof. J. F. Thorpe ("Co-operation in Science and Industry", *NATURE*, 123, 531; 1929) have been considered of such importance that they are now made available for Polish students. Mention is made also of the formation of the Parliamentary Science Committee in Great Britain last year. Finally, there is a lengthy survey of recent acts and regulations issued by Polish legislative bodies and higher education authorities and an account of the purely educa-

tional and scientific (especially biological) aspects of the exhibition held last year at Poznan.

IN connexion with the anniversary of Galen's birth (A.D. 130) a small exhibition has been prepared at the Wellcome Historical Medical Museum, 54 Wigmore Street, W.1.

PROF. G. VON HEVESY, of Freiburg im Breisgau, will deliver the Hugo Muller Lecture of the Chemical Society on Wednesday, Mar. 26. The title of the lecture will be "The Chemistry and Geochemistry of the Titanium Group".

DR. W. H. MILLS, University lecturer in organic chemistry in the University of Cambridge, has been awarded the Longstaff Medal for 1930 of the Chemical Society for his distinguished researches in organic chemistry, especially in its relation to stereochemistry. The presentation of the medal will be made at the annual general meeting on Mar. 27.

SURGEON-CAPTAIN SHELDON FRANCIS DUDLEY has been awarded the Chadwick Gold Medal and Naval Prize of £100 for his medical and sanitary work and scientific researches during the past five years and before, directed to the prevention of disease among men of the Royal Navy. The clause of the Chadwick Trust Scheme under which the award is made permits the presentation of a similar prize and medal once in every five years to a medical officer of the Navy, Army, or Air Force who, in the opinion of the Medical Director-General of his arm of the service, shall have in the preceding five years specially assisted in promoting the health of the men of the force to which he is attached.

THE Essex Field Club will celebrate its fiftieth anniversary on Saturday, Feb. 22, when a special commemoration meeting will be held in the Great Hall of the West Ham Municipal College, at which a number of distinguished scientific workers and others interested in the Club will be present. The president of the Club, Mr. D. J. Scourfield, and the Mayor of West Ham will hold a joint reception at three o'clock in the afternoon, and speeches will be made by the Countess of Warwick, the Lord-Lieutenant of Essex, the Chairman of the Essex County Council, Sir Henry Miers, Sir A. Smith Woodward, and Sir David Prain. An evening conversazione will follow, when a special exhibition of natural history and microscopical objects and of topographical photographs and prints of Essex will be made, and lantern lectures will be given by Mr. W. E. Glegg and Mr. S. Hazzledine Warren. The Club's Museum, which adjoins the College, will be closed to the general public, and will be available for inspection by guests on the occasion.

WE have received Part 4 of Vol. 3 of the *Peking Society of Natural History Bulletin* (June 1929. Peking: The China Booksellers. 1.50 dollars.) It contains six scientific articles, of which no less than four are written by Chinese university graduates. The subjects treated include the reproductive system of a Chinese Katydid, the anatomy of water snails, and the taxonomic characters of dragonflies and

*Cyclops*, all of which are illustrated by black and white plates. The Society is to be congratulated on being able to issue this well-printed journal, which is destined to become the medium for making known zoological discoveries in China.

THE latest catalogue (No. 340) of Messrs. W. Heffer and Sons, Ltd., Petty Cury, Cambridge, gives the titles of nearly 3000 volumes dealing with mathematics, physics, astronomy, chemistry, metallurgy, anthropology, ethnology, botany, agriculture, geology, geography, medicine, physiology, zoology, and biology. It also contains a lengthy list of portraits of men of science.

APPLICATIONS are invited for the following appointments, on or before the dates mentioned:—A senior lecturer in science at the Notts County Technical College and School of Art, Newark—The Principal, County Technical College and School of Art, Newark (Feb. 17). A bacteriologist and pathologist under the County Borough of Belfast and Belfast Port Sanitary Authority—The Town Clerk, Belfast (Feb. 21). A technical assistant under the Directorate of Ordnance Factories of the War Office—The Permanent Under-Secretary of State for War (C.4), War Office, Whitehall, S.W.1 (Feb. 22). Temporary assistant chemists at the Government Laboratory—The Government Chemist, Clement's Inn Passage, W.C.2 (Feb. 22). A demonstrator in the Division of Bacteriology and Immunology of the London School of Hygiene and Tropical Medicine—The Secretary of the London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1 (Feb. 24). A lecturer in physics at

Chelsea Polytechnic—The Principal, Chelsea Polytechnic, Manresa Road, S.W.3 (Feb. 25). A scientific assistant under the Board of Greenkeeping Research—The Director of Research, St. Ives Research Station, Bingley, Yorks. (Feb. 28). Two junior technical officers in the Admiralty Technical Pool for an Admiralty Experimental Establishment, mainly for work in connexion with acoustical and electrical apparatus—The Secretary of the Admiralty (C.E. Branch), Whitehall, S.W.1 (Feb. 28). An assistant dairy bacteriologist in the Department of Agriculture and Horticulture of the University of Bristol—The Registrar, The University, Bristol (Mar. 1). A scientific research officer in the Irrigation Branch of the Punjab Public Works Department—The Secretary to the High Commissioner for India, General Department, 42 Grosvenor Gardens, S.W.1 (Mar. 31). A farm manager and lecturer in animal husbandry and a stockman and dairy instructor at the Arab Agricultural School, Tulkarem, Palestine—The Private Secretary (Appointments), Colonial Office, 2 Richmond Terrace, Whitehall, S.W.1 (Mar. 31). A professor of physics at East London College—The Academic Registrar, University of London, South Kensington, S.W.7 (April 8). A professor of geography at Birkbeck College—The Academic Registrar, University of London, South Kensington, S.W.7 (April 10). A lecturer in petroleum production, in the Department of Oil Engineering and Refining of the University of Birmingham—The Secretary, The University, Birmingham (April 16). A reader in physics in the University of Dacca, East Bengal, India—The Registrar, the University of Dacca, East Bengal, India (April 30).

### Our Astronomical Column.

**Prediction of the Sunspot Curve.**—Prof. Dinsmore Alter gave an address at the meeting on Jan. 1 of the British Astronomical Association, in which he described researches on the effects of the different planets on sunspot activity. The method adopted was that described by Prof. E. Brown in vol. 69 of *Mon. Not. Roy. Ast. Soc.* Prof. Brown noted that the sunspot period was not very different from the period of Jupiter; he found that by combining the tidal influences of Jupiter and Saturn he could get a curve that followed that of the observed sunspot activity very closely. His prediction of a late maximum in 1907 was fulfilled; since then the curve has been carried on to 1955, and its agreement up-to-date with the observed curve is fairly close, though the 1917 maximum is predicted too early. Later, the inner planets were introduced; since tidal action varies as the inverse cube, this partially compensates for their smaller masses; the fact of the tidal influence being appreciable is explained by the approximate equilibrium between gravitation and light-pressure at the sun's surface.

**Observers' Handbook.**—This annual, issued by the Royal Astronomical Society of Canada, is edited by Prof. C. A. Chant, and contains this year a useful catalogue of stars down to magnitude 3.5. It gives magnitude, both apparent and absolute, proper motion, parallax, distance in light years and radial velocity. There is a similar list for stars within 5 parsecs of the sun: the latter list has been steadily growing, and now contains 35 stars, of which only four

exceed the sun in luminosity. The one of smallest luminosity is Wolf 359, the absolute magnitude of which is 16.5, implying that its luminosity is one fifty-thousandth part of the sun's. In the list of satellites the name 'Triton' is inserted for Neptune's satellite. This very suitable name was suggested by the late M. Camille Flammarion, and is now adopted by many astronomers.

**The Constant of Aberration.**—The fact that aberration has an annual period introduces the difficulty of eliminating seasonal effects, due to temperature or other meteorological causes, from measures made for its determination. Mr. H. R. Morgan contributes a paper to *Astr. Jour.* No. 933, in which he deduces a value for the aberration constant from observations in declination of stars near the pole made with the 9-inch transit-circle at the U.S. Naval Observatory, Washington, between 1903 and 1925; as the stars were observed at both upper and lower culmination, the observations being made near the beginning and end of the night (at which times the aberration is almost wholly in declination), and each star was observed twice in the year at intervals of 6 months, reasons are given for believing that seasonal terms have been nearly eliminated. This conclusion is supported by the fact that different groups of stars give accordant results. The value adopted for the constant is  $20.479'' \pm 0.008''$ . Using Michelson's latest value for the velocity of light, the corresponding distance of the sun is 92,895,300 miles, and its parallax is  $8.800'' \pm 0.003''$ .