

comparative psychology. Moral and social development were then studied in his "Morals in Evolution" (1906), in which he utilises on a magnificent scale the data of anthropology and history in the establishment of a social morphology indispensable to the evolutionary point of view in sociology.

Armed with the conclusions derived from these researches into empirical fact, Hobhouse returned to the metaphysical problem in his "Development and Purpose" (1913; revised and rewritten in 1927). He shows that development consists in the extension of harmony through a series of syntheses. Development proceeds by the liberation of elements originally in conflict, the building up of structures of varying degrees of plasticity and coherence. The power behind this liberation and these syntheses is mind, essentially a correlating activity, manifested in all orderly structure, but more clearly in living organisms, which are interpreted as a modification of mechanical structure by teleological factors, and eventually emerging in the form of conscious purpose in the human mind, as expressed in the advancing movement of civilisation. Mind is, on this view, not coextensive with reality, but is the principle of orderly growth within it. It is limited by the material it works upon, and its purposes themselves undergo development. His fundamental principle, which he entitles 'conditioned teleology', is examined both from the point of view of the logical requirements of systematic explanation and its value as an instrument in scientific investigation in the fields of biology and sociology.

In a further series of works collectively entitled the "Principles of Sociology" (1918-1924), Hobhouse sought once more to apply his basic conception of mind as a correlating agency to the problems of social life. In the first of these, "The Metaphysical Theory of the State" (1918), he gave what is now generally regarded as the most penetrating criticism of the Hegelian theory of the State and prepared the ground for a social philosophy which would do justice at once to individual development and the requirements of the common good. In the "Rational Good" (1921) he works out his ethical theory of the good as a harmony of

mind with its objects, a consilience of all living experience in a comprehensive system of purposes. In the "Elements of Social Justice" (1922) he applies these ethical ideas to the problems of social organisation and proves their value by the light which he is able to make them throw upon the practical problems of economics and politics. Finally, in his "Social Development" (1924) he gives us a synthesis of his scientific and philosophic studies bearing on the human problem. He first studies development from the point of view of empirical science and seeks to correlate the several aspects of social change in the light of non-ethical criteria analogous to those that might be employed in the study of biology. He then turns to the ethical problem of valuation, and finally argues that social and ethical development have a common end, rooted in the fact that the good is to be found in organic harmony. Taken together, these works must assuredly come to be recognised as the most comprehensive and scientific attempt that has yet been made to trace out the working and possibilities of rational purpose in human evolution.

Prof. Hobhouse was profoundly interested in the bearings of recent developments in the physical sciences upon the nature and validity of knowledge, as will be evident to readers of the revised edition of "Development and Purpose". He intended to devote himself on retiring from the chair of sociology to work on these problems. His sudden death has deprived the world of the results of his ripe speculation in this field of thought, and this can only deepen our sense of the loss of a great thinker, distinguished alike by a rare nobility and beauty of character, and by magnificent intellectual grasp and power.

MORRIS GINSBERG.

WE regret to announce the following deaths:

Sir Baldwin Spencer, K.C.M.G., F.R.S., emeritus professor of biology in the University of Melbourne and author, with F. J. Gillen, of works on the Australian aborigines, aged sixty-nine years.

Dr. W. J. Viljoen, Superintendent-General of Education of the Cape Province and first vice-chancellor of the University of South Africa, aged fifty-nine years.

News and Views.

IN his presidential address to the British Medical Association, delivered at Manchester on July 23, Prof. A. H. Burgess reviewed some aspects of the influence of other sciences upon the practice of modern surgery. The era of 'modern' surgery was inaugurated by Lister, and the present use of aseptic methods is merely the natural advance from the antiseptic technique as originally practised: antiseptics are still used for cleansing the skin and when sepsis is already present. As a sequel to the safety engendered by the use of these methods, the surgeon has access to all parts of the body, the spinal canal and thoracic cavity as well as the abdomen. Perhaps surgery is most indebted to the two sciences of physics and physiology during more recent years: it is only necessary to mention the aid brought by

radiology, and radium and light therapy, by localisation of function in the brain, by the use of blood transfusion, by the discovery of vitamin D and insulin, and by the development of biochemical methods of investigating the body's functions. Prof. Burgess recalled in some detail the influence which these various discoveries had exerted upon surgical treatment. X-rays were first used in the accurate diagnosis of injuries to the bones and in diseases of the chest, the bones being relatively opaque and the lungs transparent: where the density of neighbouring tissues is similar, it is now the practice to administer or inject either a substance which is opaque to the rays, or air, which is transparent, and so by displacing tissues or tissue fluids enables a differentiation of the organ under examination to be made from the

neighbouring tissues. In Manchester, 20 per cent of patients pass through the X-ray department as compared with 1 per cent twenty years ago.

THE use of radium in treatment has had a twofold influence on the surgeon: it has sometimes replaced treatment by the knife, but at others a surgical approach to the seat of disease is necessary before the radium can be usefully applied. At the present moment, opinion seems to favour reversion to the external application of radium, but using relatively enormous quantities and at a much greater distance from the skin. The practice of actinotherapy has revolutionised the treatment of surgical tuberculosis, in which disease surgical removal of damaged tissues has been replaced by immobilisation and drainage, whilst the general resistance of the body is increased by its exposure to the sun or other source of light. The story of the development of our knowledge of the localisation of function in the brain illustrates the mutual reactions of clinical medicine and experimental physiology upon one another. The first step was clinical, the localisation of the speech area by Broca and the motor area by Jackson, and was followed by the experimental investigations of Ferrier, Horsley, Sherrington, and others, so that to-day the diagnosis of the site of an injury to, or lesion of, the brain is quite precise. A similar interplay of medicine, pathology, and physiology is seen in the development of our knowledge of the functions of the thyroid gland. Work such as this and other recent advances in treatment based on joint clinical and experimental investigations serves to show the importance of co-operation between clinicians and experimentalists.

A MEMORIAL tablet to Sir Humphry Davy has just been unveiled in the Pump Room of the Wirer Endowment at Ischl in Austria, to commemorate his stay at that watering-place. The ceremony was performed in the presence of a distinguished party, including the Austrian Chancellor, Dr. Streeruwitz, who in a speech dwelt upon the gratitude the world owes to the inventor of the miner's safety lamp. It was on May 26, 1818, that Davy embarked at Dover for Naples, whither he was going to study the problem of unrolling the papyri found at Herculaneum. His journey took him up the Rhine and Danube into Austria and Hungary, and on this journey he took the opportunity of making observations of the formation of mists over rivers and lakes, which at that time was not understood. The rivers he studied included the Inn, the Ilz, the Raab, the Save, the Ironzo, the Po, and the Tiber, his results being contained in his paper to the Royal Society of Feb. 25, 1819, entitled "Some Observations on the Formation of Mists in Particular Situations".

THE scientific work of the Czechoslovak biologist, J. E. Purkyně (Purkinje), like that of many other pioneers, has largely escaped attention, although a number of men of science have, from time to time, referred to the importance of his contributions to many branches of biology. Purkinje was born near Prague on Dec. 17, 1787, and died there on July 28,

1869, and on the occasion of the sixtieth anniversary of his death, Dr. O. V. Hykeš has collected and issued in pamphlet form ("Přírodovědecké práce J. E. Purkyně") a selection of comments and appreciations of his work by well-known biologists. Purkinje's researches cover subjects in microscopic anatomy, cytology, neurology, the physiology of vision and of the ear, biochemistry and anthropology. An American writer in 1899 declared that Purkinje, under the most unfavourable conditions, had laid the foundations for modern physiology. Although the compound microscope had been in use for nearly a century, his discoveries, up to 1830, were made with the aid of simple lenses, yet he was the first to use the microtome. When unable to pursue a subject exhaustively, Purkinje time and again pointed the way to a noteworthy discovery. He was the first to employ the term protoplasm and to establish the identity of structure in plant and animal cells. Purkinje's work has hitherto attracted most attention in Germany and Scandinavia.

It is generally recognised that while many local museums include a number of objects illustrating the life of the population of the area in medieval and later times, an urgent need is a national museum for England which will illustrate the traditional arts, industry, and life generally of the folk. Wales already has a national museum of this character, and there are similar collections in Ireland and Scotland. The matter is undoubtedly one of some urgency, as objects of the character contemplated are becoming more and more difficult to obtain every day. The council of the Royal Anthropological Institute, having these facts in view, has appointed a small committee to consider the position. Lord Onslow, Sir Henry Miers, and Dr. R. E. Mortimer Wheeler have accepted appointment to the committee. The Royal Society, the Zoological Society, the Society of Antiquaries, the Folklore Society, and other interested bodies have nominated, or have been invited to nominate, representatives to sit on the committee. It is hoped to hold a conference to discuss ways and means early in the autumn.

A COMMITTEE has been formed to establish a Memorial Fund with which the name of the late Prof. L. T. Hobhouse may be permanently associated, to be used to assist in the perpetuation of his influence. The committee consists of Prof. S. Alexander, Sir William Beveridge, Mr. Victor Branford, Dr. Morris Ginsberg, Dr. G. P. Gooch, Mr. J. L. Hammond, Mr. J. A. Hobson, Prof. Gilbert Murray, Prof. Percy Nunn, Sir Herbert Samuel, Mr. C. P. Scott, Sir Hubert Llewellyn Smith, Sir Arthur Steel-Maitland, Prof. Graham Wallas, and Mrs. Beatrice Webb, and subscriptions may be sent to Dr. G. P. Gooch, 76 Campden Hill Road, London, W.8. It is hoped that subscribers may leave it to this widely representative committee to frame a scheme for the memorial and to decide at a later date whether the fund raised can be best used for a lectureship, scholarship, or the publication of studies in the social sciences. Dr. Morris Ginsberg, London School of Economics,

Aldwych, W.C.2, has agreed to act as honorary secretary of the Fund.

AN interesting suggestion for a possible origin of early Mesopotamian culture is put forward by Mr. Henry Field, of the Field Chicago Museum, in the *Times* of July 17. As a result of recent archaeological survey work conducted by the Marshall Field North Arabian Desert Expeditions, it would appear that the North Arabian and Syrian deserts, which in palæolithic times were well watered, then supported a considerable semi-nomadic population, of which traces have been found in the form of palæolithic implements on several hundred sites. These range from Upper Chellean, found *in situ* at a depth of 11 feet 6 inches, to Upper Palæolithic. It is suggested that at about the time of Cro-Magnon man in western Europe, the desiccation of the North Arabian area began, and finally drove the population, by that time in a neolithic stage of culture, westwards to the Nile Valley and eastwards to Mesopotamia, where they constituted the earliest inhabitants. On the evidence of the earliest skeletal remains found in the lowest levels of Kish, it would appear that the earliest inhabitants of that area may well have been direct descendants of the Palæolithic and Neolithic peoples of the North Arabian desert.

PROF. S. LANGDON, who forwards Mr. Field's letter to the *Times*, adds a much-needed caveat. While recognising the importance and the significance of the discovery of this extensive palæolithic culture of the Syrian desert, he hesitates to accept it as the source of Sumerian or prehistoric Mesopotamian culture. As he points out, it raises the question whether this culture is to be attributed to the Sumerians of Elam and of Central Asia and of the Indus Valley or to the Semites of Akkad. The excavations at Kish and Jemdet Nasr appeared to have settled this question definitely in favour of the proto-Sumerian Elamite people. Prof. Langdon emphasises the significance of the fact that while no painted pottery has been discovered in the Syrian desert within 2000 years of the date of that at Kish, in Elam and Central Asia, at water level at Kish and at plain level at Jemdet Nasr, the painted ware is accompanied by epigraphical material, seals and copper of undoubted Elamitic affinities which would all point to the proto-Sumerians of the east as the founders of this civilisation. Mr. Field's interesting suggestion may well serve to throw light on the early migrations of the Semitic peoples. It fails to withstand the weight of the evidence to which Prof. Langdon refers, which is all against a Semitic origin for the earliest culture of Mesopotamia.

THE following elections have been made to Beit Memorial Fellowships for Medical Research, the place of research being given in brackets: *Fourth-year Fellowships* (value £500 per annum): Mr. R. J. Lythgoe and Mr. M. W. Goldblatt. *Junior Fellowships* (value £400 per annum): Mr. R. Hill, to investigate the specificity of hæmoglobins and the properties of cytochrome (Biochemical Laboratory, Cambridge); Dr. Ann Bishop, to complete the study on which she has been engaged during last two years of the morpho-

logy and development of *Trichomonas* of man and monkeys (macaques) in culture and to investigate other intestinal protozoa (Molteno Institute for Parasitology, Cambridge); Mr. C. L. Cope, to study the diuretic responses of normal and pathological kidneys in man to tubule diuretics (Department of Medicine, Oxford University); Dr. L. E. Bayliss, to study the metabolism of the isolated heart and kidney by means of the heart-lung and heart-lung-kidney preparation and by means of the artificial oxygenator of Bayliss, Fee, and Ogden (Department of Physiology and Biochemistry, University College, London); Dr. W. P. Kennedy, to investigate the function of the ovary (Physiology Department, Edinburgh University, and Royal Infirmary, Edinburgh); Mr. E. Boyland, to investigate the mechanism of carbohydrate metabolism, with particular reference to the phosphoric esters of yeast and muscle (Lister Institute, London); Mr. E. M. Case, to study the metabolism and thermodynamics of muscle by means of a comparative study of alcoholic fermentation by yeast and lactic acid production by muscle, and by means of a new apparatus to investigate the thermal properties of so-called 'non-irritable' muscle, concurrently with chemical analyses (Sir William Dunn Institute of Biochemistry, Cambridge); Mr. K. A. C. Elliott, to undertake studies on biological oxidations such as the oxidation of metabolites by various thermolabile and thermally stable peroxidases (Biochemical Laboratory, Cambridge); Miss M. H. Roscoe, to continue investigations on the distribution of the antipellagra vitamin B2 in natural foodstuffs and a comparison with the distribution of the anti-neuritic vitamin B1 (Lister Institute, London).

IN honour of the sixtieth birthday, on June 27, of Prof. Hans Spemann of Freiburg, a special number (Heft 25) of *Die Naturwissenschaften* has been issued. A portrait of Prof. Spemann precedes an article of half a dozen pages in which Dr. Otto Mangold gives an account of the main lines of Prof. Spemann's work and the results achieved. This is followed by a list of Prof. Spemann's publications from 1895 until 1929, and by a list of important investigations carried out by pupils and collaborators in more or less close relation with their master, and finally by a series of abstracts, by the respective authors, of the memoirs which form the recently published five-volume 'Festschrift' in honour of Prof. Spemann in *Roux's Archiv für Entwicklungsmechanik* (Bände 116-120). This massive 'Festschrift' and the special number of *Die Naturwissenschaften* are well-merited tributes to one who is held in the highest esteem not only for his manipulative skill, his keen powers of analysis and interpretation and his lucid exposition, but also for his great personal qualities.

THE Department of Mines of the Dominion of Canada has issued its customary Annual Report for the year ending Mar. 31, 1928. This report gives evidence of the great advances made in all departments of the Canadian mineral industry. This is sufficiently shown by the fact that the value of the mineral production of Canada has quadrupled since the year 1900. A matter of special interest in this

report is the reference to the memorial tablet erected by Mr. Fenley Hunter of New York City to the late Dr. George M. Dawson, at one time Director of the Geological Survey of Canada. All who either remember Dr. Dawson personally or who appreciate the admirable work which he did for the Canadian Geological Survey will be pleased to learn that this permanent memorial to him has been erected on an exceptionally suitable spot, namely, on the bank of the Liard River, just north of the boundary line between British Columbia and Yukon, in the delimitation of which Dr. Dawson's surveys have played so conspicuous a part.

THE Annual Report for 1927-28 of the Director of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington details very numerous, varied, and important work in the domain of terrestrial magnetism and electricity. The non-magnetic ship *Carnegie* was being prepared for the world-cruise now in successful progress. Owing to this the amount of field work on land was severely curtailed, but the Department carried on land observational work at its two important observatories at Huancayo, Peru, and Watheroo, Western Australia. In addition, many interesting investigations, both experimental and theoretical, were made in regard to problems of atomic magnetism, terrestrial magnetic variations, wireless propagation, the high-frequency permeability of iron, and other related topics.

IN order to centralise and arrange a methodical plan for the scientific work which is carried on in northern Norway, Svalbard, Jan Mayen, and the Arctic Sea, a Central Committee for the Scientific Institutions at Tromsø has been recently constituted, the statutes for which have now been sanctioned by the Department of Education. According to Northern News Service, the Geophysical Institute at Tromsø will act as a weather-forecasting and aurora observatory, and Prof. Krogness will have the assistance of Prof. Vegard and of other scientific men working in the north, including Mr. Soot-Ryen, who has made valuable researches into the fauna of the coasts of northern Norway. The committee's aim is to forward co-operative work between the different scientific institutions of Tromsø and the north.

ON July 19, Sir Thomas Middleton unveiled at Dishley Grange, in Leicestershire, a memorial to Robert Bakewell (1725-95), the pioneer of stock-breeding. The movement to commemorate the great English farmer was started by Prof. Scott Watson, of the University of Oxford, who had raised money in both Canada and America for the purpose. In his address Sir Thomas Middleton said that the prosperity of the nineteenth century was largely due to improvers, such as Bakewell, in the preceding century, and that his methods had influenced and are influencing stock-breeding throughout the world. Bakewell with great foresight realised that the need of the future was beef and mutton to feed the rapidly increasing town populations, and that this problem could best be met by breeding the right type of stock. Without some new means of providing meat, the

industrial expansion would have been impossible. Before his time, animal breeding had been carried on in a haphazard fashion with no definite aim behind it, and it was due to the fact that Bakewell started with a clear objective that his enterprise met with such success. His aim was to obtain animals that weighed heaviest, matured earliest, and most quickly repaid the food they consumed. He obtained his best results with sheep, but also applied his principles to the breeding of cattle, cart-horses, and pigs. The prices he secured for the letting of improved sires testify to the esteem in which he was held by other farmers of his day, and the wide application of his methods by others shows that he is rightly to be considered one of the greatest agricultural pioneers of the eighteenth century. After unveiling the memorial, Sir Thomas Middleton placed a laurel wreath on Bakewell's tombstone, which lies in the ruins of the old church.

MR. JOHN PATERSON has been appointed Director of the Meteorological Service of Canada, in succession to Sir Frederic Stupart, who retired at the end of June, after fifty-seven years' service.

PROF. F. A. E. CREW, of the Animal Breeding Research Department of the University of Edinburgh, has been elected a foreign member of the Czechoslovak Agricultural Academy.

IN view of the long-continued drought in Great Britain, the Ministry of Health has issued a "Memorandum on Water Shortage", suggesting that water authorities should lose no time in scrutinising the position and considering whether any supplementary supplies are available in their neighbourhood. Suggestions are also made for conserving existing supplies by detection and prevention of waste, temporary reduction or intermission of discharges of compensation water, and use of alternative supplies, if any. It is considered that restriction of the supply for domestic use should be resorted to only in cases of actual necessity.

THE following appointments have recently been made by the Secretary of State for the Colonies in the Colonial Agricultural Services: Mr. W. H. Edwards, lecturer in entomology and zoology at the College of Agriculture, and acting botanist and mycologist, Mauritius, to be entomologist, Jamaica; Mr. S. M. Gilbert, superintendent of agriculture, Nigeria, to be assistant director of agriculture, Trinidad; Mr. A. Pitcairn, district agricultural officer, Tanganyika, to be assistant director of agriculture, Cyprus; Mr. J. R. Mackie, superintendent of agriculture, Nigeria, to be deputy assistant director of agriculture, Nigeria; Dr. R. H. Le Pelley, to be assistant entomologist, Kenya; Lieut. J. Eaden, to be assistant manager, Experimental Fruit Farm, Sierra Leone; Mr. H. E. Green, to be inspector of plants and produce, Agricultural Department, Gold Coast; and Mr. E. Lawrence, to be district agricultural officer, Nyasaland.

A RECENTLY issued catalogue of Messrs. Francis Edwards, Ltd., 83 High Street, Marylebone, W.1, is No. 516, giving particulars of nearly 800

second-hand works relating to the Far East, *i.e.* Japan, China, Korea, Formosa, Siam, Philippine Islands, and the East Indian Archipelago.

APPLICATIONS are invited for the following appointments, on or before the dates mentioned:—An assistant master, to teach engineering, at the Rochester Technical Institute and Junior Technical School—The Principal, Technical Institute, Rochester (Aug. 3). A temporary pathologist in the Public Health Laboratories of the County Council of the West Riding of Yorkshire—J. C. McGrath, County Hall, Wakefield (Aug. 3). A lecturer in mathematics in University College, Nottingham—The Registrar, University College, Nottingham (Aug. 5). A university librarian of the University of the Witwatersrand, Johannesburg—The Secretary, Office of the High Commissioner for the Union of South Africa, South Africa House, Trafalgar Square, W.C.2 (Aug. 10). A head of the Engineering Department of the Smethwick Municipal College—The Director of Education, 215 High Street, Smethwick (Aug. 12). A lecturer in agricultural botany at Armstrong Col-

lege—The Registrar, Armstrong College, Newcastle-upon-Tyne (Aug. 17). Temporary assistant chemists at the Government Laboratory—The Government Chemist, Clement's Inn Passage W.C.2 (Aug. 17). Women senior lecturers in botany and microbiology, physics, zoology and physiology, and a lecturer in domestic science, at Huguenot University College, Wellington, Cape Province—The Registrar, Huguenot University College, Wellington, Cape Province, South Africa (Oct. 1). An experimental assistant at the Air Defence Experimental Establishment—The Superintendent, Air Defence Experimental Establishment, The Aerodrome, Biggin Hill, near Westerham, Kent. A woman lecturer in geography or biology with mathematics (subsidiary) at the Bishop Otter Training College for Women Teachers, Chichester—The Principal, Bishop Otter Training College, Chichester. A woman with training in pathology, biology, or physiology, and interested in poultry, for poultry research—laboratory and field work—at the Wellcome Physiological Research Laboratories—The Director of the Laboratories, Langley Court, Beckenham.

Our Astronomical Column.

Large Meteors.—An illustrated article by James Stokley, issued by Science Service of Washington, D.C., describes some of the largest meteor falls on record. There is a striking illustration of Meteor Crater, Arizona, which is 4000 feet in diameter, and strongly resembles one of the smaller lunar craters. It is now generally agreed, from the age of the trees on its rim, that this was formed by the fall of a gigantic meteor, not less than seven centuries ago. A sketch of an equal area located among the skyscrapers of New York shows what enormous damage might be done by such falls if they came in populous districts. The largest in modern times fell in the Yenisei Province of Siberia on June 30, 1908, when the area affected was 40 miles in diameter; there was great destruction of animals and trees.

Prof. Charles P. Olivier, who is the director of meteoric observation in the United States, is quoted as saying that most of the meteors observed are moving in hyperbolic orbits. This evidently implies a much greater excess over the parabolic velocity than is found in the case of comets; the excess in these is too slight to be detected in the comparatively rough determinations that are alone possible for meteors. Hence the meteors having such speeds cannot belong to the solar system, but are merely passing through it, having had their origin somewhere in the region of the stars.

Dr. W. J. Luyten, stationed at the South African branch of Harvard College Observatory, reports that the great mass of iron recently found in that region is a genuine meteor; he estimates it at 50 tons, which would make it the largest meteoric mass known. The Ahnighito meteor, now in New York, weighs 36½ tons.

Curvature of Space.—The *News Service Bulletin* of the Carnegie Institution of Washington, No. 13, contains an article by Dr. E. P. Hubble describing the further work of Mr. M. Humason and Dr. F. G. Pease at Mt. Wilson Observatory on the radial velocities of spiral nebulae. Note has already been made in this column of their conclusion that the apparent velocity of recession is proportional to the distance of the

object, and is thus evidence of the truth of de Sitter's deduction from the theory of relativity that remote objects should have a displacement of their spectral lines towards the red.

A few months ago the highest velocity found was that of the nebula N.G.C. 7619 in Pegasus, the distance of which was estimated as 25 million light-years; it appeared to be receding at the speed of 2400 miles per second. By using very long exposures, extending to 40 hours, the spectra of three nebulae in a cluster in Coma Berenices, near the pole of the Galaxy, have now been photographed. The distance of the cluster was estimated, by methods already described, as 50,000,000 light-years; the speeds of recession found are 4900 miles per second for N.G.C. 4860, 4600 miles for N.G.C. 4853, and 3100 miles for N.G.C. 4865. The first two support the theory of speed being proportional to distance; the third does not fit so well. Observations of other nebulae in the region are planned; it is considered possible that N.G.C. 4865 does not belong to the cluster, but is a small nebula at a less distance.

Period of the Lyrid Meteors.—Mr. Maltzev of Leningrad has been investigating the Lyrid meteoric shower and finds a period of 29.70 years to accommodate satisfactorily some of the observations. He inquires as to where details can be found of the rich display which occurred in 1863, but there seem to be very few accounts of it. However, in the B.A. Report for 1863, p. 325, there is a note on the phenomenon by Prof. H. A. Newton which may be of some use. Mr. W. F. Denning writes that he has tried on several occasions in past years to deduce a period for the shower and found 16.1 years and 29.65 years will conform with a number of the most striking displays. He does not, however, regard them as having a perfectly satisfactory application, for they do not accommodate the various showers in 1803, 1851, 1863, and a few other returns. We require more data, and this may only be obtained by careful watches of the shower in future years. Its exhibitions during the past half a century have generally been somewhat feeble.