papers, dealing with the formation of a function of which the behaviour at its singular points is specified *a priori*, was the occasion for a paper presented to the Berlin Academy, in association with the name of Mittag-Leffler, by Weierstrass. It is perhaps opportune to remark that the intimately related construction, by Weierstrass, of an integral function with given zeros, which one might naturally have thought to be suggested by Gauss's factorisation of the gamma function, was given only in 1874, when Weierstrass was fifty-nine years old (letter to Sonja Kowalewsky, *Acta Math.*, **39**, 151); and that the form of Gauss's factorisation which exactly suggests the general theorem was given in 1848, by F. W. Newman, in the *Camb. and Dublin Math. Journal*, **3**. This was remarked by the late G. B. Mathews in the pages of NATURE, long ago; it is not referred to by Mittag-Leffler in dealing with Weierstrass's early investigations (1843, 1856) on the analytical *Facultäten*. Another matter of a different kind occupied Mittag-Leffler in a series of papers: the expression of a function, with singularities for finite values of the independent variable, in a form which is valid over the whole plane as dissected by lines passing to infinity from the singular points of the function. Other papers, many written in Swedish journals, are not as yet so well known.

News and Views.

AGRICULTURE is the oldest of the chemical industries. The business of feeding man and his friends has, fortunately, been able to jog along for a very long time without entering into any close relationship with synthetic chemical industries other than that carried on so universally and so successfully by certain of the lower organisms of the soil. There has, moreover, been a disinclination to apply some of the new knowledge that has been placed at the service of the farmer, it being dismissed as being of little consequence when compared with the accumulated practical experience of generations on the land. Doubtless, too, the lack of consideration has not all been evidenced on one side. However this may be, it is a fact that we cannot continue indefinitely to live on the reserve fertility of the virgin plains of the earth. Sir Alfred Mond, in an address read before the delegates to the Imperial Agricultural Research Conference at Billingham on Oct. 18, based his remarks on this truism, and on the part which synthetic chemical industry must play in the future development of agriculture. So far as the British Empire is concerned, the economic aspect of the situation is no less considerable than the scientific. As was pointed out in the address, for many years Europe has paid to South America millions upon millions of pounds for nitrogen in the form of guano or of sodium nitrate. Imperial Chemical Industries, Ltd., has set itself the ambitious task not only of supplying the whole Empire with fertilisers, but also of acquiring and disseminating information concerning their application to soils of varying qualities and varying needs.

NITRAM, LTD., the selling organisation which has been set up to deal with the new synthetic fertilisers, has, said Sir Alfred Mond, already instituted a free and disinterested advisory service to farmers. It has also established a research station, with upwards of 400 acres of farm lands, where problems relating to the use of fertilisers and to the feeding of stock are to be investigated. The activities at Billingham, however, will not be confined to the manufacture of simple synthetic nitrogenous fertilisers, but will extend to the production of compound fertilisers, containing nitrogen, phosphorus, and potassium—the three chief plant foods—according to the demands of experiment and experience. Naturally, the fertiliser requirements of the British Isles will be the first to receive attention.

A CAREFUL consideration of Sir Alfred Mond's address leads one to the conclusion that, although he had no startling or even new thesis to present, he was able to show that Imperial Chemical Industries, Ltd., fully realises the nature of the problem—that of most effectively using chemical and mechanical knowledge in the multiplication of the fruits and riches of the earth—in its future as well as in its present aspects, and that the organisation is solving it in a patriotic as well as in a commercially successful manner. It is not merely a question of there being so many more mouths to feed and bodies to clothe each year. Neither is it entirely a question of meeting a demand for a more varied food supply; for satisfying the requirements of a generation better instructed than its fathers in the relation of diet to health. There is also an increasing demand from the chemical industries themselves for new material. The artificial silk industry is a case in point; the alcohol motor-fuel industry is another; and man has only just begun to learn the rules for training bacteria, in 'commercial numbers,' to do his will.

THE Slaughter of Animals (Scotland) Bill, which comes before the House of Commons for its third reading on Nov. 15, provides for the licensing of slaughterers in order to check unskilful slaughtering, and for the stunning of animals with a mechanically operated instrument before slaughter. At the committee stage considerable concessions had to be made to the opponents of humane slaughtering: the effect of the bill was restricted to slaughter-houses and knackers' yards, swine were exempted from the operation, and the usual exemption for Jewish slaughtering was introduced. While the first two, at least, of these concessions will be generally regretted by humanitarians, there can be no doubt that they were wisely made, for in exchange the opponents of the bill have undertaken to allow it to pass into law. Indeed, the Government would not need any great courage to adopt the bill as its own during the final stages. The subject is to be discussed at a debate arranged by

the University of London Animal Welfare Society at Birkbeck College, Bream's Buildings, Chancery Lane, at 8 P.M. on Friday, Nov. 4. The principal speakers will be Mr. A. C. Dewbury, representing the Royal Society for the Prevention of Cruelty to Animals, and Mr. A. C. Knight, representing the Meat Traders' Federation; the chair will be taken by the president of the University society, Prof. F. T. G. Hobday, principal of the Royal Veterinary College. The public will be admitted to the debate without ticket.

DR. WILLIAM G. SAVAGE delivered the Malcolm Morris Memorial Lecture (under the Chadwick Trust) on Oct. 17, the subject being "Food Poisoning." After paying a tribute to the memory of Sir Malcolm Morris, the lecturer said that food poisoning in the main is a result of the complexity of our food supply and might be classified thus: (1) the poison is inherent in the food, *e.g.* poisonous fish; (2) the poison may be an admixed poisonous substance accidentally introduced, *e.g.* arsenic; or (3) the poison may be of bacterial origin, by far the largest class. Earlier conceptions of food poisoning were dominated by the idea that the poisoning was from decomposed food in which poisonous chemical substances were generated by bacterial action, and this was commonly known as 'ptomaine poisoning.' This idea is, however, entirely erroneous—there is no such thing as ptomaine poisoning. Tainted food does not as a rule cause food poisoning; in nearly all cases the food is perfectly good physically. The cause is elsewhere, and is generally due to certain special bacilli gaining access to the food and having poisonous properties but do not decompose the food; it is a definite infection of the food. It is particularly manipulated and much handled foods that become infected, such as chopped meat, meat pies, sausages, and canned foods. The bacilli usually gain access to the food from an outside source, through lack of adequate care in preparation or storage, or by contamination through flies or vermin. The prevention of food poisoning depends upon a knowledge of where the bacilli live and how they gain access to the food, and in adequate supervision of the preparation and storage of made-up foods.

THE stone implements recently discovered by Mr. J. P. T. Burchell in Co. Sligo, Ireland, will be on exhibition in the rooms of the Society of Antiquaries of London, Burlington House, Piccadilly, between the hours of 10 A.M. and 6 P.M. from Monday, Nov. 21, until Tuesday, Dec. 6, inclusive. The rooms of the Society will be closed to the public at 1 P.M. on the following dates: Nov. 23, 24, and 26, until 10 A.M. Monday, Nov. 28; Dec. 1 and 3, until 10 A.M. Monday, Dec. 5.

THE Huxley Memorial Lecture of the Royal Anthropological Institute for the year 1927 will be delivered by Dr. Ales Hrdlička, of Washington, on Nov. 1, at 8.30 P.M., at the rooms of the Royal Society, Burlington House. Dr. Hrdlička has taken as his subject "The Neanderthal Phase of Man"—a subject which he has made peculiarly his own and upon which he may be expected on this occasion to put forward views of no little importance for the study of early man. At the conclusion of the lecture the Huxley Memorial Medal of the Institute will be presented to Dr. Hrdlička. Tickets for the lecture may be obtained on application to the Hon. Secretary of the Royal Anthropological Institute, 52 Upper Bedford Place.

MISS CATON-THOMPSON has left for Egypt, where, during the coming winter, she will continue her work of exploration in the Northern Fayum. She proposes this year to devote herself to an examination of the graves in the hope that she may be able to find material which will throw light upon the dating of the early civilisation of this area which she has discovered in her previous season's work. A very high antiquity has been attributed by some authorities to this remarkable culture. If, therefore, the investigations of this year should meet with any measure of success, the results should prove of very special importance. As the arrangements under which Miss Caton-Thompson has worked hitherto have now lapsed, the present expedition is being carried on under the direction of the Council of the Royal Anthropological Institute, which has applied to the Egyptian Department of Antiquities for a concession. The Council of the Institute invites subscriptions towards the cost of the expedition, which will amount to at least £1000. Contributions should be addressed to the Hon. Treasurer, Royal Anthropological Institute, 52 Upper Bedford Place, W.C.1.

AMONG the recent acquisitions at the British Museum (Natural History), we notice the following:—A large collection of mammals, birds, and birds' eggs from Abyssinia; a large collection of leeches, earthworms, tapeworms, etc., and a collection of millipedes from Colombia, and two shells of the extremely rare and much prized gastropod *Voluta bednalli*. Only two or three examples of this species are known. A collection of European and exotic Coleoptera and of Hemiptera Heteroptera (plant bugs) bequeathed by the late Mr. G. C. Champion. The major portion of the bequest consists of some 120,000 beetles from various parts of the continent of Europe, forming probably the richest European collection in Great Britain. Also a collection of 8406 Lepidoptera (butterflies and moths) presented by Mr. G. T. Bethune Baker. This donation includes a large number of types and paratypes of species described by its late owner, as well as 5574 specimens of British Tortricidæ (small moths, many of them of great economic importance), comprising the entire collection of these insects formed by Mr. Richard South. About 500 seeds and fruits collected by the donor, Miss M. Chandler, in the Upper Eocene clay of Hordle, Hants, and described by her in the monograph of the Palæontographical Society. Many of these are new to science; the whole flora shows relations to that now living in the Far East, and indicates a warmer climate. Some fine ammonites and other fossil cephalopod shells recently collected from the Gault of Dorset have been presented by Lt.-Col. R. H. Cunnington, and the Gault of Glynde, Sussex, has yielded to the

careful search of Mr. C. T. A. Gaster nearly a thousand tiny ammonites belonging to about 14 species. The Lower Permian Sandstones near Exeter have from time to time yielded footprints and other tracks of extinct animals, and Mr. Clayden has added to the national collection four slabs with very unusual tracks of origin as yet unexplained.

AN Italian Arctic expedition by airship is being planned for next year. The *Times* announces that the expedition will be organised and led by General U. Nobile, who accompanied Capt. R. Amundsen in his polar flight in 1926. The Italian government has offered airship N.4, which is a sister ship of the *Norge*, used on that occasion, and the Norwegian Aero Club has promised the use of airship sheds at Vadsö and King's Bay. General Nobile intends to make his Arctic base in Spitsbergen and to explore eastward to the north of Siberia, intending no doubt to throw light on the unknown northward extension of Nicholas Land. He proposes also to make a flight to the Pole. The Soviet Government has expressed a wish to help by establishing a base with supplies at the mouth of the Yenisei River. At present a committee at Milan is considering the cost of the project. The Royal Italian Geographical Society has promised its support.

THE newly formed Greenland Association of Copenhagen, which is seeking to open up this great sub-Arctic territory, learns that the University of Michigan, U.S.A., is sending a scientific expedition to this great island to study and report on the meteorological conditions prevailing there. The expedition will be under the charge of Herr Helge Bangsted, who proposes to build an Ice-station somewhere in the centre of Greenland, where the condition of the great ice-cap will be studied and general glacial researches made. Mr. Bangsted, it may be remembered, was a member of the Knud Rasmussen expedition to Greenland sometime ago.

AN original suggestion has been made to Signor Mussolini by an engineer and architect named Pio Franchi. His idea is to execute an exact model, in high relief, of the Italian peninsula from the Alps to Cape Passaro, the southernmost point of Sicily, to be placed in a miniature lake sixty metres in diameter, representing part of the Mediterranean and Adriatic Seas, with the exact imitation of every geographical detail—mountains, rivers, lakes, towns, railroads, etc. The principal rivers, such as the Po, the Tiber, and the Arno, would be represented by rivulets of running water, reproducing the exact curves. It is proposed to place this relief model in the Villa Umberto, the object being to give children and the general public a clear idea of their country. The idea has, says the *Monitor*, met with the Duce's approval, so that it will be shortly carried out.

THE eighteenth annual exhibition of electrical, optical, and other physical apparatus, organised by the Physical Society and the Optical Society, is to be held on Jan. 10–12, 1928, at the Imperial College of Science and Technology, South Kensington. The exhibition committee invites offers from research laboratories and institutions, and from individual research workers, of suitable exhibits for the research and experimental section of the exhibition. Offers of exhibits in this section should be communicated immediately, and in any case not later than Nov. 16, to the secretary, Physical and Optical Societies, 1 Lowther Gardens, Exhibition Road, London, S.W.7.

AT the annual statutory meeting of the Royal Society of Edinburgh, held on Oct. 24, the following officers and members of council were elected :—*President*, Sir James Ewing; *General Secretary*, Prof. R. A. Sampson; *Treasurer*, Dr. J. Watt; *Curator of Library and Museum*, Prof. D'Arcy W. Thompson; *Councillors*, Prof. G. Barger, Mr. J. Bartholomew, Prof. C. G. Darwin, Prof. D. Waterston, Mr. J. W. Peck, Dr. J. Ritchie, Prof. R. Stanfield, Dr. A. L. Turner, Dr. G. W. Tyrrell, Prof. J. H. Ashworth, the Hon. Lord Constable, Prof. E. Taylor Jones.

VIOLENT earthquake shocks were recorded in various parts of the United States and Canada on Oct. 24. The greatest disturbances seem to have been registered between 11 A.M. and 11.20. Mr. J. J. Shaw, of West Bromwich, records in the *Times* that his instruments registered large movements, beginning just after 4 P.M. on Oct. 24, which corresponds to 11 A.M. Eastern time, and continuing until about 5.20.

THE Report of the Progress of the Ordnance Survey for 1926–27 has been published (London: H.M. Stationery Office, 9*d*. net). Among the achievements may be noted the completion of the "Popular Edition" of the 1-inch map of England and Wales, and the publication of fifteen sheets of the same map of Scotland, making a total of twenty-five sheets of that country. The 10-inch map of Great Britain is now complete in three sheets; the 1/M physical map of England and Wales is being improved, and a similar map of Scotland is in hand. The usual revision in the field of the large-scale maps has been carried out, but the reversion to quarter sheets of the 6-inch map has caused some delay in publication. A revised edition of the map of Roman Britain will shortly be ready. A considerable amount of archæological work has been undertaken. Lastly, it may be noted that the output of maps, exclusive of those for other departments, reached more than three-quarters of a million, and sales of maps showed a marked increase.

THE long spell of wet weather in Great Britain that began in June and continued with extraordinarily few breaks up to the end of the holiday season, had a very abrupt end when a ridge of high pressure advanced from the Atlantic on the night of Oct. 2 behind an unusually fast-moving depression which had caused gales and very heavy rain in the north. A general sustained upward 'surge' of the barometer then occurred over a wide area, and this converted the 'ridge' into a large circular anticyclone in the space of twelve hours. At 7 A.M. on the morning of Oct. 3 this anticyclone lay centrally over the British Isles, and was still growing in size. It proved very persistent, and inaugurated a long spell of dry weather over the whole country. At Kew Observatory slight rain fell on

Oct. 1 and 2, amounting altogether to two millimetres, but from then up to the 21st there was an unbroken succession of days with no rain or only a fraction of a millimetre. At Glasgow and Plymouth a dry spell of almost equal length has been recorded, which would have been a general experience over practically the whole of England and a large part of Scotland but for some local rain in the Midlands and the north on Oct. 12. This has been the longest spell of drought at Kew this year, and unless some decided change takes place, October, normally the wettest month, may prove to be for London very much the driest in the present year.

THE Compton medal of the Institution of Automobile Engineers has been awarded to Mr. H. R. Ricardo for his paper entitled "Some Notes on Petrol-Engine Development."

THE Cambridge University Press will shortly publish "A Short History of Western Civilisation," by Prof. A. F. Pollard, the aim of which is to trace the origin and growth, in its essential features, of the European civilisation of to-day. The same publishers are also issuing "The Antiquity of Man in East Anglia," by J. Reid Moir, who has endeavoured to give an easily understood account of the remains discovered in Norfolk and Suffolk which, in many cases, are of such a nature as to have implications extending far beyond the relatively small area in which they were found.

APPLICATIONS are invited for the following appointments, on or before the dates mentioned:—A pathologist and curator at the Royal London Ophthalmic Hospital—The Secretary, Royal London Ophthalmic Hospital, City Road, E.C.1 (Oct. 31). A lecturer in the pharmacy department of the Sunderland Technical College—The Chief Education Officer, 15 John Street, Sunderland (Nov. 7). A farm director at the Rothamsted Experimental Station—The Secretary, Rothamsted Experimental Station, Harpenden, Herts (Nov. 14). A chemical assistant in the laboratories of the Research Association of British Flour Millers—The Director of Research, Research Association of British Flour Millers, Old London Road, St. Albans. A teacher in mechanical engineering at the Barnsley Mining and Technical College—The Principal, Mining and Technical College, Barnsley. An engineering assistant in the electrical engineer's department of Stoke-on-Trent—The City Electrical Engineer, St. George's Chambers, Kingsway, Stoke-on-Trent. A clinical pathologist at the Crichton Royal Mental Hospital, Dumfries—The Physician Superintendent, Crichton Royal Mental Hospital, Dumfries.

Our Astronomical Column.

BRILLIANT METEORS ON OCT. 17.—Mr. W. F. Denning writes that "on the night of Oct. 17 three brilliant meteors were visible at the following times respectively: $21^h\ 55^m$, $22^h\ 15^m$ and $23^h\ 36^m$. The meteor of $22^h\ 15^m$ was a Capricornid; the other two were fine Orionids. The one which appeared at $23^h\ 36^m$ was a very brilliant object and observed from Yorkshire and from Erith, Kent. The meteor passed from over Cromer to east of Nottingham, and fell from a height of 86 to 52 miles. The luminous flight was about 92 miles long, and the velocity 38 miles per second. The maximum of the Orionid shower usually occurs on Oct. 20 or 21, and the appearance of several large meteors from it as early as Oct. 17 induces the supposition that the display may have been of rather unusual richness this year."

THE ATMOSPHERES OF THE GIANT PLANETS.—The *Scientific American* for October contains an article on this subject by Prof. H. N. Russell, who writes from the Lowell Observatory, Flagstaff, and utilises many of the beautiful planetary photographs obtained there by Dr. E. C. Slipher, some of which are reproduced. (A small slip should be noticed; the markings seen on Saturn in 1876 and 1903, and used for finding the time of rotation, are described as *dark* instead of *bright*.)

The radiometric observations of Coblentz and Lampland are quoted as proving that the outer regions of the atmospheres of the giant planets are at a very low temperature; but that, as there is a series of cloud layers many thousands of miles thick, these would be an effective blanket to outward radiation, and the temperatures at the surfaces of the planets may be much higher.

As is well known, the spectra of these planets show a series of strong absorption bands, which steadily increase in strength as we travel out from Jupiter to Neptune. This suggests that a very low temperature is required for their production; the suggestion is made that, if a long tube were cooled by a surrounding jacket of liquid air and filled with various gases, a study of their spectra might give a clue to the identification of the gases producing the bands. It is noted as a possible clue that some of the oxides of nitrogen can be protected from decomposition only by keeping them very cold. The great variety of colours seen on the discs of Jupiter and Saturn is given as an additional proof that a large number of gaseous compounds are present.

The photographs that are reproduced were taken in light of different colours. As might be expected, those in violet light show much greater darkening at the limbs, for the same reason that the setting sun looks red. The polar regions of Saturn are especially dark. The light from the ring, when photographed in yellow light, looks about equal to that from the middle of the disc, but in violet light the ring is the brighter.

TABLES FOR MOTION IN AN ELLIPSE.—Dr. Innes has published a very useful table, giving the abscissæ and ordinates of a point describing an elliptical orbit under gravitation. The focus is the origin, and the major axis is the axis of x. The values are given to five places of decimals, the semi-major axis being taken as unity. They are given at intervals of one degree of M, the mean anomaly, and for intervals of 0·01 in the eccentricity, extending from 0·00 to 1·00. The tables are mainly intended for work with rectangular co-ordinates, but they are also very useful for those who prefer polar co-ordinates, since $\tan v = Y/X$ and $r = X \sec v$ or $Y \operatorname{cosec} v$. Similar tables have appeared before, but not on quite such an extended scale. They are useful both in the computation of ephemerides and of perturbations. They form an appendix to *Union Observ. Circular*, No. 71.