

to attempt to arrest the progress of the plague. Prof. Raynal of Poitiers proposes, as a last remedy, the radical destruction of all vineyards situated at the boundary of the infected districts, and the establishment of a "neutral" zone.

THE Chair of Chemistry in the newly established Agricultural College of Berlin, is to be filled by Prof. H. Landolt, of Aix-la-Chapelle, well known by his exhaustive studies on the relations between the optical properties of bodies and their chemical constitution. His wide experience in saccharimetry has likewise led to his simultaneous appointment as director of the Chemical Laboratory established at Berlin by the German *Verein für Rübenzucker-Industrie*. Prof. Landolt is succeeded in the Polytechnic of Aix-la-Chapelle by Prof. A. Classen, who has recently published two favourably-received laboratory manuals on Qualitative and Quantitative Chemistry.

It will be a surprise to many to learn, the *Gardeners' Chronicle* tells us, that General Munro, C.B., whose decease occurred on the 29th ult., had claims on the respect of his countrymen as a learned botanist as well as a distinguished soldier. He contrived to combine with his military duties such a knowledge of general botany and horticulture, and so close a study, so searching an investigation of the characters, affinities, nomenclature, and classification of grasses, as to have been for many years the most trustworthy referee in that difficult order. With the exception of a monograph on the Bamboos in the *Transactions* of the Linnean Society, General Munro found time to publish but little. That monograph, however, affords sufficient evidence of his ability, industry, and profound knowledge of his subject. It was elaborated, we believe, in one of the intervals of active service. When, two or three years since, he retired from the army and established himself near Taunton, he at once commenced a general monograph of the whole order. This was intended to form one of the monographs in the series of such works now being issued in continuation of the *Prodromus* by MM. Alphonse and Casimir de Candolle. To the abiding loss of botany this monograph remains incomplete. It is to be feared that a long time must elapse ere any competent monographer will take upon himself the irksome labour of elaborating such a work.

M. BERROT, the director of the École Normale Supérieure died at Paris on February 3, at the age of fifty-six.

THE *Photographic News* informs us that Prince Leopold is a good chemist and has a practical knowledge of photography.

THE fragments of the 38-ton gun destroyed for experimental purposes in the bursting-cell in the proof-grounds, Government Marshes, adjoining the Royal Arsenal, Woolwich, on Tuesday last, have all been recovered, and are found to number about 120 pieces. They have all been marked, and are being washed and arranged for inspection. The two projectiles were taken from the sand-butt in front of the gun, both broken in pieces, and it is evident from the appearance of the bore that they broke up before leaving the gun, the marks of the rifling being in parts quite effaced. The muzzle end of the steel tube, about 3 feet in length, is intact, with parts of the wrought iron super-coil remaining attached, and a singular appearance is presented by the rearmost end of this fragment, the steel having been violently rent and incurved as though a shot or lighter fragment, moving faster than itself, had overtaken it and struck it with considerable force. The crusher gauges fixed on both projectiles have been recovered, but give no positive data respecting the pressure produced by the explosion. A very great pressure had been expected, and the copper crushers had consequently been subjected to a pressure of thirty-five tons to the square inch before being inserted in the plugs. This pressure was not exceeded in the explosion, and the only apparent deduction arrived at of importance is that a strain which would not be

alarming in the powder chamber has sufficed to burst the gun at the spot where its thickness and strength suddenly diminished.

THE publication is announced of a magnificently illustrated "Iconographical History of the Orchid," by M. E. de Puydt, Secretary of the Royal Society of Agriculturists at Mons.

THE *New York Herald* publishes a despatch from Havannah, of date January 28, stating that the recent earthquake was felt in San Diego, Santiago de las Vegas, Pinar del Rio, Cienfuegos, Mariel, and other places. The small town of San Cristobal was almost destroyed. On January 24, at 7.45 P.M., an earthquake was felt at Karlsruhe, Rastadt, and Spier. It appears to have consisted of three different shocks, the direction being from west to east, and the duration about ten seconds. The shock was also felt in Durlach, Mühlburg, Daxlanden, Eggenstein, Sollinger, Lenkenheim, Weingarten, Hittenheim, Philippsburg. The commotion was very great, principally in Pletteersdorf, close to Rastadt, where the inhabitants were so frightened that they left their houses. It appears that in the vicinity of Spier a second shock was felt on the 28th, from 3 to 4 A.M. A severe shock of earthquake occurred in the Kurram Valley, Afghanistan, on the 8th inst. Smart shocks of earthquake were felt at Sion, in the Valais, on Saturday week.

AT a recent meeting of the Boston Society of Natural History, Mr. F. W. Putnam remarked on the character of the shell-heaps of the Atlantic and Pacific coasts of North America, and stated that there had been received at the Peabody Museum a small collection of articles taken from rude dolmens (or chambered barrows, as they would be called in England), recently opened by Mr. E. Curtiss, who is now engaged, under his direction, in exploration for the Peabody Museum. These chambered mounds are situated in the eastern part of Clay Co., Missouri, and form a large group on both sides of the Missouri River. The chambers are, in the three opened by Mr. Curtiss, about 8 feet square, and from 4½ to 5 feet high, each chamber having a passage-way several feet in length, and two in width, leading from the southern side, and opening on the edge of the mound formed by covering the chamber and passage-way with earth. The walls of the chambered passages were about 2 feet thick, vertical, and well made of stones which were evenly laid without clay or mortar of any kind. The top of one of the chambers had a covering of large flat rocks, but the others seem to have been closed over with wood. The chambers were filled with clay which had been burnt, and appeared as if it had fallen in from above. The inside walls of the chambers also showed signs of fire. Under the burnt clay, in each chamber, were found the remains of several human skeletons, all of which had been burnt to such an extent as to leave but small fragments of the bones, which were mixed with the ashes and charcoal. Mr. Curtiss thought that in one chamber he found the remains of five skeletons, and in another thirteen. With these skeletons there were a few flint implements and minute fragments of vessels of clay. A large mound near the chambered mounds was also opened, but in this no chambers were found. Neither had the bodies been burnt. This mound proved remarkably rich in large flint implements, and also contained well-made pottery and a peculiar "gorget" of red stone. The connection of the people who placed the ashes of their dead in the stone chambers with those who buried their dead in the earth-mounds is, of course, yet to be determined.

HER MAJESTY'S Consul at Hakodate, Japan, states in his just published report that a botanical garden has been started at that place. The matter originated with private individuals as the suggestion of a foreign lady, but the Kaitakushi, or Colonisation Department, has taken the matter in hand, and has started a public garden. In order to give it the character of a public

and to illustrate the history of the Greek race in the ancient, Byzantine, and Neo-Hellenic periods, by the publication of memoirs and unedited documents or monuments in a journal to be issued periodically. 2. To collect drawings, fac-similes, transcripts, plans, and photographs of Greek inscriptions, MSS., works of art, ancient sites and remains, and with this view to invite travellers to communicate to the Society notes or sketches of archaeological and topographical interest. 3. To organise means by which members of the Society may have increased facilities for visiting ancient sites and pursuing archaeological researches in countries which, at any time, have been the sites of Hellenic civilisation.

AMONGST the prizes offered by the Istituto Reale Veneto di Scienze e Lettere at Venice we mention the following:—(1) 1,500 lire (about 58*l.*) "for a detailed description of the determinations hitherto made of the mechanical equivalent of the heat unit, investigation of causes, &c.;" (2) 3,000 lire (116*l.*) "for a representation of the advantages which the application of physics has brought to medical science, and to clinical medicine in particular;" (3) 3,000 lire "for a summary of the recent investigations in theoretical hydrodynamics, followed by a representation of the true and essential progress made in this part of scientific mechanics;" (4) 3,000 lire "for a description of the most recent hypotheses in physical science concerning the phenomena of light, heat, electricity, and magnetism, followed by an indication of the changes which scientific language would have to undergo in order to be in accordance with the best founded theories, this indication to be illustrated by some examples describing some of the principal phenomena." The competition for the first and fourth of these prize-themes ends on March 31 next, that for the second and third on March 31, 1881. For further details we must refer our readers to the Institution itself.

ON his passage through Rome, Dr. Gerhard Rohlfs was received in special audience by the King of Italy, who personally decorated the great traveller with the Commander Cross of the Italian Order of the Crown.

THE Royal Academy of Sciences at Turin has awarded the Bressa prize for the four years 1875 to 1878, to Mr. Charles Darwin.

WE had occasion some time ago to call attention to the excellent scientific work which is being carried on at the Carlsberg Laboratory, Copenhagen. This laboratory of research, it will be remembered, was founded and endowed by Mr. J. C. Jacobsen with the intention of aiding, as far as possible, in placing upon a secure scientific basis the technical processes of brewing and malting. We have now before us a Report of the work carried out during the past year. This is published under the title of "Meddelelser fra Carlsberg Laboratoriet" by the committee of management appointed by the Royal Danish Academy of Sciences. The original report is in Danish and is accompanied by a very full *résumé* in French. We append the titles of the principal papers embodied in the Report:—"Contributions à la Connaissance des Organismes qui peuvent se trouver dans la Bière et le Moût de Bière et y vivre," par E. Chr. Hansen. "Sur l'Influence que l'Introduction de l'Air atmosphérique dans le Moût qui fermente exerce sur la Fermentation," par E. Chr. Hansen. "Recherches sur les Ferments producteurs de Sucre," par J. Kjeldahl. (1) Recherches sur la Diastase; (2) Recherches sur la Ptyaline (Diastase de la Salive).

WITH regard to distinguishing artificial from natural butter, M. Donny remarks, in a recent note to the Belgian Academy, that the two behave very differently when heated between 150 and 160 degrees in a capsule or test-tube. At this temperature artificial butter produces very little froth, but the mass undergoes a sort of irregular boiling, accompanied by violent jerks which

tend to project some of the butter out of the vessel. The mass grows brown, but this is by reason of the caseous matter separating out in clots on the walls; the fatty portion of the sample sensibly retains its natural colour. Natural butter, on the other hand, heated to 150° or 160° produces abundant froth, the jerks are much less pronounced, and the mass grows brown but in a different way. A good part of the brown colouring matter remains in suspension in the butter, so that the whole mass has a characteristic brown aspect similar to that of the sauce called *au beurre noir*. All natural butters behave thus, and it is strange, M. Donny says, that this simple method of distinguishing natural from artificial butter has not been indicated before.

A BODY of Russian *savans* is expected to go next spring into the Slavonic Balkan provinces to study their geology and ethnographically examine the palæographic architectural remains. The expenses of this expedition are to be defrayed by the Russian Geographical Society and a Slavonic committee.

THE death is announced at New Braunfels, in Texas, of Ferdinand Lindheimer, a German botanist, long settled in Texas, for the botany of which he did much by the valuable collections he made.

SEVERAL shocks of earthquake were felt at Havana on the night of January 22. On Sunday last two slight shocks were felt at Carlsruhe.

A MUNICH correspondent describes an interesting anatomical model recently constructed by Prof. Rüdinger of that city. The model represents a whole human body, life-size, which can be taken to pieces in eight different ways. The sixteen section planes thus obtained show most minutely all anatomical details. The model was executed, under the learned professor's direction, by Messrs. Zeiller.

THE *Gazette de Lausanne* of January 20 publishes a very interesting letter by Dr. Forel, on the probability of the Lake of Geneva being frozen during this winter. After having made several measurements on January 15, Dr. Forel proved that the temperature of water throughout the lake (at a certain distance from the shores) was on that day equal to 5°·2 Celsius. Now comparing this figure with the temperature of water measured at various depths on October 23, 1879, he concludes that the water of the lake has lost during eighty-five days no less than thirty calorific units for each square centimetre of its surface, and that it must lose twenty-four units more to reach the temperature of maximum density (4° Celsius), when a superficial freezing might become possible. The laws of freezing are but imperfectly known; but applying to the Lake of Geneva the results of measurements he has made during December last on the frozen Lake Morat, Dr. Forel concludes that the waters of the former lake must lose eight calorific units more to lower the temperature of the water at the surface to the freezing-point. Thus the waters of Lake Lemman must lose altogether thirty-two calorific units per square centimetre of surface before any freezing would become possible. The lake having lost but thirty units from October 23 to January 15, we ought to experience a period of cold of the same intensity as that which was experienced during the last three months, for the freezing of the lake. But, according to the computations of Prof. Plantamour, it would be highly improbable that the cold December of 1879 should be followed by a January as cold as that of 1830. Thus, it is highly improbable that the Lake of Geneva will freeze during this year, but it is possible that the "Little Lake" (*i.e.*, its south-western part) might freeze in January. January, however, is near an end, and we have not yet heard of the lake being frozen.

THE ice on the Loire continues to occupy the French engineers. The works are proceeding actively but not very

sors Ayrton and Perry a variety of apparatus, as also Siemens Brothers, Newall and Co., and others. Prof. Helmholtz ended on Tuesday his visit to London, and went with Mr. Spottiswoode, president of the Royal Society, to his country house at Coombe Bank, Sevenoaks. From thence he proceeds to Dublin to receive an honorary doctor's degree from the University of that city.

THE National Fisheries Exhibition will be opened at Norwich by the Prince of Wales on the 18th inst. The delay in opening it has been caused by the necessity for enlarging the space to admit of satisfying the numerous applications that have poured in. Every point connected with the growth and nurture of fish, the modes of capturing them, the condition of the fishermen will be illustrated. The aquatic fauna of Norfolk and Suffolk will be a special feature, as also fish-eating birds. The Earl of Ducie, Viscount Powerscourt, Lord Lovat, Mr. Spencer Walpole, and Prof. Huxley, H.M. Inspectors of Fisheries; and Mr. Calcraft, Permanent Secretary to the Board of Trade, have been appointed by the Home Secretary to act as Her Majesty's Commissioners. In addition to a large number of special money prizes, Government gold, silver, and bronze medals, diplomas of honour, will be awarded by the jurors. Prof. Huxley will give an address on the occasion.

MUSEUM NO. 1 in the Royal Gardens, Kew, will be reopened to the public on Easter Monday, after being closed during the winter. It has been enlarged by the addition of a new wing, terminating in a wide staircase with ascending and descending flights. The expense has been borne by the India Office in consideration of the maintenance at Kew of the botanico-economical collections recently forming part of the India Museum. The whole collections have been entirely re-arranged by the curator, Mr. John Jackson, A.L.S. On the staircase has been placed a large painted window, presented to the museum by Alderman W. J. R. Cotton, M.P. This window represents the successive stages of cotton cultivation and manufacture. Amongst other recent additions to the museum may be mentioned a series of models of farm and garden vegetables prepared and presented by Messrs. Sutton of Reading; a collection formed by Col. Pearson, who has charge of the Indian forest-students at Nancy, of the various objects manufactured in France from native-grown woods; a further series of vegetable products and manufactured articles, collected in Afghanistan by Surgeon-Major Aitchison. The collection of portraits of botanists has also been much enlarged and re-arranged. An oil portrait of Thomas Andrew Knight, F.R.S., well known for his classical researches in vegetable physiology, has been presented on behalf of the family by Sir Charles Rouse Boughton, Bart.

THE President of the United States of America has notified to the French Government his intention of appointing a special commission to preside over the arrangement of the American Section at the Electrical Exhibition. A number of commissioners have been already selected for the purpose. M. Philippart has written to M. Berger, placing at his disposal a sum of 4000*l.* for the best system presented of transporting electric force at a distance.

ON Sunday week a deputation composed of eminent representatives of French science waited upon the venerable M. Milne-Edwards to present him with a medal in commemoration of the completion of the great naturalist's work on Comparative Physiology and Anatomy. Warm congratulatory addresses were made by MM. Quatrefages, Blanchard, and Dumas, the last speaking of himself as the oldest of M. Milne-Edwards's friends. In thanking the deputation the recipient of this well-earned honour was naturally much moved.

ON March 26, in presence of the Minister of the Interior, the Commission of the Observatory, several State functionaries and

men of science, there were repeated at the Brussels Observatory experiments with Van Rysselberghe's telemeteorograph, which prove that the registration of the meteorological elements by this instrument may be made automatically at very great distances (several hundred kilometres). The author explained to the Minister a plan of International Telemeteorography, the realisation of which would be of the greatest utility for the scientific study of the atmosphere, and which would render possible the prevision of the weather.

THE destruction caused by the Chios earthquake has been even greater than we stated last week. The Constantinople Correspondent of the *Daily News* sends some interesting particulars: The temperature on the 3rd was heavy and oppressive, and the horizon was broken by broad flashes of light that seemed to denote a coming storm. In all this atmospheric disturbance however the inhabitants saw nothing extraordinary; and were far from being alarmed by what they fancied would result in a thunderstorm. At ten minutes to two in the afternoon a terrific shock was felt, bringing three-fourths of the houses in the town to the ground like so many packs of cards, and burying a thousand persons under the falling ruins. Then commenced a fearful scene of horror. The ground rocked and danced, kneading the ruin already formed into an unrecognisable mass of stone. The survivors ran hither and thither, not knowing where to flee to escape the horrible fate that menaced them, and were tossed and flung about by the heaving earth, like feathers in a breeze. Even those who gained the open country were by no means safe. The earthquake attacked not only the towns and villages, but worked its ravages in the hills and mountains of the island. Enormous masses of rock and earth came rushing down the hill-sides, carrying all before them, bounding far into the plains, and tearing roads in the solid rocks of the mountain such as might have been formed by a torrent a thousand years old. The town presented a pitiable spectacle. Great fissures and crevices yawned in the streets, walls were falling with a crashing report, and entire buildings crumbled in fragments to the ground. In many places whole streets had disappeared, and it was hard to say where the different well-known buildings had stood. The ground still heaved and tossed, bringing fresh buildings to the ground at every moment, and hurrying innumerable victims to destruction. It is impossible to say what the number of victims would have been if a second shock had not displaced the ruins formed by the first and thus permitted thousands of sufferers to escape or to be rescued by others from the horrible imprisonment to which they had been condemned. All the fissures and crevices run from east to west. In the country the effects of the horrible upheaval have been even more terrible than in the town. The shocks are now, April 8, diminishing. In all there were counted 250 since the first three awful upheavals which destroyed the greater part of the island. A telegram of the 12th states that earthquake shocks of considerable violence have recommenced in Chios, and it is estimated that barely twenty houses now remain habitable in the whole island. Forty-five villages have been totally destroyed, and in many localities the population has absolutely disappeared.

SOME slight shocks of earthquake were felt on the morning of the 5th inst. at San Cristobal, Cuba. A violent shock was felt at two o'clock on Sunday morning throughout the centre of California. Earthquakes were reported from South Hungary on Wednesday last week.

THE *Daily News* Naples correspondent, telegraphing on the 6th, states that Mount Vesuvius was displaying greater activity. Abundant streams of lava were descending northwards, and great numbers of smoke fissures had opened round the crater, some at 100 metres distance from the centre of eruption.

NOTES.

PROF. GRAHAM KERR has just received a letter from Mr. J. S. Budgett in which the latter announces that he has solved the important problem of the development of *Polypterus*. The letter is written from southern Nigeria and dated August 28. It appears that Mr. Budgett has been able to fertilise a large quantity of eggs of *Polypterus senegalus*, and that the early development is "astoundingly frog-like"—segmentation being complete and fairly equal, and the process of invagination resembling that of the frog's egg. Prominent neural folds are formed which arch over in the normal fashion. Mr. Budgett had already made three expeditions to various parts of tropical Africa in his endeavour to obtain material for studying the development of *Polypterus*, and zoologists will rejoice that his efforts have been at last attended with success. The Crossopterygians have been for some time the most important vertebrate group awaiting the investigation of the embryologist, and the results gained by Mr. Budgett in the working out of his material in the laboratory will be looked forward to with the greatest interest by all vertebrate morphologists.

A MOVEMENT is in progress for erecting a memorial of James Watt, and at a meeting recently held it was decided that the form the memorial should take should be an institution for scientific research, and an appeal is now being made for funds to carry out the project. Mr. Andrew Carnegie, who is the secretary for America, has promised a subscription of 10,000*l.* towards the object.

THE Bombay University Syndicate announces that the subject selected for the Dr. Theodore Cooke memorial prize for 1905 is "Electric Traction and the Application of Electricity to the Requirements of Cities in India." Competitors for the prize should be graduates in engineering of the University of Bombay of not more than seven years' standing.

THE second International Congress of Philosophy is to be held in September of next year in Geneva.

THE fourth International Congress of Psychology will, it is stated, meet in Rome in the spring of 1905, instead of in the autumn of 1904, as had been arranged.

DR. LOUIS PARKES has been appointed to succeed the late Prof. Corfield as consulting sanitary adviser to H.M. Office of Works.

THE forty-eighth annual exhibition of the Royal Photographic Society opens to-day at the New Gallery, Regent Street. The exhibition will remain open until October 31.

FURTHER trials on the electric railway at Zossen have resulted in a speed of nearly 114 miles an hour being attained.

AN exhibition of the pathological specimens which have been added to the St. George's Hospital Museum during the past year will take place at the museum from October 1 to 17.

THE death is announced of Mr. Washington Teasdale, of Leeds, at the age of seventy-three. He was a fellow of several scientific societies, and president of the Leeds Astronomical Society.

A REUTER telegram from Santiago de Cuba announces that a shock of earthquake, the most violent since 1885, occurred there on the morning of September 19, and lasted fifteen seconds.

THE death, at the advanced age of eighty-five, is announced of Dr. Alexander Bain, who for twenty years occupied the chair of logic in the University of Aberdeen, and was a voluminous writer on language, logic, psychology, and kindred subjects.

IT is stated by Reuter that the private subscriptions towards Captain Bernier's projected North Pole expedition amount to 12,000*l.*, of which Lord Strathcona has given 1000*l.* It is also stated that the Canadian Government will probably build and equip the vessel for the expedition.

A PROVINCIAL sessional meeting of the Sanitary Institute will be held at the University of Birmingham on Saturday next, September 26. A discussion on some practical considerations in connection with modern methods of treating sewage will be opened by Prof. A. Bostock Hill and Mr. J. E. Willcox.

THE Colonial Economic Committee of Berlin announces that the utility of the gutta-percha discovered by the expedition which was undertaken to New Guinea under the leadership of Herr Schlechter has so far been established that the gutta-percha from the low-lying country may be regarded as suitable for cable purposes as an admixture, and, if carefully obtained, be fit for cables in a pure condition. Large quantities of gutta-percha have been obtained from New Guinea, and are at present being tested, the Secretary of State for the Imperial Post Office having granted a large sum of money for the purpose. It is proposed by the Colonial Economic Committee to establish a gutta-percha enterprise for the education of the native population of New Guinea in the cultivation of gutta-percha and its winning. This will take the form of a fresh expedition under Herr Schlechter for a period of three years. Assistance will be given by natives of Borneo and others familiar with the question of rubber production.

A SUCCESSFUL journey through eastern Mongolia (supplementing a more extended journey accomplished last year by Mr. Campbell, Chinese Secretary of the British Legation) has, says a Peking correspondent of the *Times*, just been completed by Mr. Claude Russell and Mr. Hicks Beach. The party left Peking on July 20, and, passing through Jehol, struck north to the Manchurian Railway at Tsitsihar, which was reached in forty-eight days. Their route lay east of the Khingan Mountains, the distance covered, 1000 miles, being to a considerable extent, so far as is known, through country not previously visited by any European. The travellers rode on ponies, with pack mules for their baggage. They had four servants, but no escort. They met with unfailing courtesy from all classes, both Mongols and Chinese. The country is thinly peopled, but is being gradually colonised by Chinese from within the Great Wall.

A BRITISH and International Aëronautical Exhibition, organised by the Aëronautical Institute, was opened at the Alexandra Palace on Thursday last. Among the exhibits are a model balloon, and kites and specimens of balloon accessories sent by the German Government, examples of Mr. S. F. Cody's kites and his gear for flying them, various flying machines either full size or in model form, and the large machine which Dr. Barton is constructing. In connection with the exhibition three competitions are to be held, silver and bronze medals being awarded to the two winners in each. The first is for kites, and in judging consideration will be taken of the way in which the kite leaves the ground, the manner in which it ascends, its steadiness, the time required to let out the whole mile of wire or string, the altitude attained, and the

of determinism" therefore depends on the recognition of electrons as bodies co-equal with ordinary physical objects. To establish this he claims that since physical objects, as well as electrons and such particles, are all 'inferences', they differ only in degree and not in kind. We must not, however, be deceived by words. Objects which we see and handle may be, as he says, as inferential as an undiscovered planet inferred from irregularities in the motion of Uranus, but the inferences are of different kinds; otherwise, why, when a planet was seen in a different position from that inferred from the irregularities, was it *without question* preferred to the 'undiscovered' inferential planet? There was not even an instinctive estimate of the 'degree' of validity to be attributed to the two 'inferences'. Unless Sir Arthur assigns to "direct observation" a status essentially different from that of rational deduction, it is difficult to see how his position can be "in no sense an abdication of scientific method". All this, however, does not affect determinism in relation to physical objects, and it is to be hoped that Sir Arthur's plain statement will do much to remove the widespread delusion that modern physics has revealed a universe of unrestrained caprice.

Centenary of Octave Chanute

ON Feb. 18 occurs the centenary of the birth of the distinguished American engineer Octave Chanute, who by his experiments on gliding made in his later years, and by his writings on flight, gained for himself a place among the chief pioneers of aviation. Born in Paris on Feb. 18, 1832, he was the son of a professor of history who in 1838 removed to the United States to become a vice-president of the Jefferson College in Louisiana. There and in New York young Chanute attended school and, in his own words, became thoroughly Americanised. Leaving school at the age of seventeen, he entered the service of the Hudson River Railroad Company, and during the next four years gained considerable engineering experience. He next spent ten years on various railroads farther west, and from 1863 until 1867 was chief engineer of the Chicago and Alton Railroad. In 1868 he built the first bridge over the Missouri at Kansas City, in 1873 became chief engineer of the Erie Railroad, and about ten years later established himself as a consulting engineer in Kansas. He had already served on the commission of engineers which led to the building of the elevated railways of New York, and at Kansas he was responsible for the construction of the Sibley Bridge over the Missouri, and for the Mississippi Bridge at Fort Madison, Indiana. He retired to Chicago in 1889 after some forty years' work, much of which had contributed to making the railway system of the United States the most extensive in the world.

CHANUTE's interest in flight was first aroused in 1874, but it was not until he was nearly sixty years of age that he was able to devote himself wholeheartedly to the study of the subject. In 1891 he published his first work, "Aerial Navigation", and this was followed in 1894 by his "Progress

in Flying Machines", a work of great historical value. He had carefully examined the results of the experiments made by Otto Lilienthal in Germany, and just before that pioneer's death in 1896 had secured a Lilienthal glider and had begun his own experiments on the 90 ft. sand-hills in Dune Park, near Lake Michigan. Finding the Lilienthal machine unsafe and treacherous, Chanute built a glider with five superimposed planes, which was afterwards altered to a quadruplane and then to a triplane. From these was evolved "the famous Chanute biplane of novel and exquisite design". One important feature introduced by Chanute was the means of moving the wings in a fore and aft direction to maintain balance, thus obviating the necessity for violent body movements. The experiments begun in June 1896 were continued until September, but after then were never resumed. An account of them was given in a paper published in the *Journal of the Society of Western Engineers* in 1897. While abandoning experiments, Chanute, although then sixty-four years of age, retained his enthusiasm for everything connected with flight, assisted and encouraged Wilbur and Orville Wright, and when an old man wrote his "Recent Progress in Aviation". He died at Chicago on Nov. 23, 1910, at the age of seventy-eight. Chanute possessed the truly scientific spirit, and was an acute observer as well as a gifted inventor. Courageous and generous, his character caused him to be both respected and honoured.

The Earthquake in Cuba

ON Feb. 3 a series of destructive earthquakes, beginning at 2.40 A.M., ruined about one-third of the city of Santiago, at the east end of Cuba, including the cathedral and many important buildings. The number of persons killed is reported as twelve, and the number of wounded as about three hundred. The earthquake was recorded at Kew Observatory as a disturbance of moderate intensity. The first impulses arrived at 6h. 26m. 45s. A.M. (G.M.T.), and the earthquake must have occurred at 6h. 16m. The neighbourhood of Santiago has long been known as one of the most active earthquake centres in the West Indies. The city was founded in 1514, and since then there have been great destructive earthquakes in 1624, 1678, 1766 (the greatest of all Cuban earthquakes), and 1852. Though the full extent of the damage is not yet known, the recent earthquake was probably of the second order of intensity among destructive earthquakes. The Santiago earthquakes are chiefly interesting owing to the position of their centres along a well-known dislocation, nearly 1250 miles long, that skirts the southern coast of the east end of the island and forms the northern boundary of the Bartlett Trough, a depression that in one part reaches a depth of 3506 fathoms, or about four miles.

An Ancient Mexican Tomb

A VALUABLE addition to our knowledge of a little-known culture of ancient Mexico, that of the Mixtec, is promised by a recent find of which news has reached New York. In a dispatch from the *Times'* correspondent which appears in the issue of Jan. 20,

problems of British agriculture. The present volume follows upon the lines of the previous issues as to the seven departments of research covered, and each of these sections is compiled by an acknowledged authority on the subject. The volumes are issued free to members of the Society upon application to the Secretary, 16 Bedford Square, London, W.C.1, and at a nominal charge of 1s. 3d., including postage, to the general public. The Research Committee, under the direction of which they are prepared, is desirous that the information contained in them should be drawn upon freely by county agricultural advisory officers and by the Press, so that it may receive a wide publicity.

Economic Research in Australia

THE *Journal of the Council for Scientific and Industrial Research* of the Commonwealth of Australia contains reports of many investigations of pressing economic problems, to some of which reference will be made under our Research Items. Here we simply wish to congratulate the Council upon the completion of its new Animal Health Laboratory, the result of a sum of £20,000 given by Mr. F. D. McMaster for that purpose. The Laboratory is placed within the grounds of the University of Sydney, alongside the buildings of the Veterinary Department, and the closest contact is maintained between the two staffs. The work already in progress in the building relates to internal parasites of sheep, including nutritional aspects of this problem, contagious mammites, certain aspects of foot-rot of sheep, and other problems. It is obvious that the Laboratory is in a position to play an important part in the study of those aspects of the Australian pastoral industry which are in great need of solution if the industry is to flourish. The building is of brick, with red-tiled roof, measures 155 feet by 43 feet, is two-storied, and has been constructed so that other stories or rooms may be added with the minimum of disturbance.

New Chief Entomologist at Rothamsted

THE position of Chief Entomologist at the Rothamsted Experimental Station, rendered vacant by the appointment of Dr. A. D. Imms as head of the new Department of Entomology at Cambridge, is to be filled by Dr. C. B. Williams, lecturer in agricultural and forest zoology, University of Edinburgh. Dr. Williams has had a distinguished career as entomologist in various parts of the British Empire; he received his training at Cambridge and then at the John Innes Horticultural Institution, Merton. After a period of travel in Canada and the United States, he was appointed to the Department of Agriculture of Trinidad, in charge of froghopper investigations, where he stayed for five years. He then became sub-director and afterwards director of the Entomological Section, Ministry of Agriculture, Egypt, and after six years' service was appointed entomologist to the East African Agricultural Research Station, Amani, Tanganyika. He is shortly proceeding to the United States of America to give a course of lectures at the Agricultural Department of the University of Minnesota, and will take up his duties at the Rothamsted Experimental Station on July 1.

Fellowship of African Research

It is announced that a Rockefeller fellowship for research work in Africa has been awarded to Miss L. C. Mair. Miss Mair has worked with Prof. B. Malinowski at the London School of Economics as research assistant. She has already left for Uganda, where she will study native social institutions with special reference to the changes which have been brought about by European settlement. The comparatively highly organised character of the social institutions of the Baganda before they came into contact with Europeans, and the readiness the people have shown in adapting themselves in certain directions to European ideas, should make this a fruitful and particularly instructive field of inquiry, especially if opportunity should arise for comparison with other areas of East Africa in which contact with European civilisation has been neither so prolonged nor so intense.

The Cuba Earthquake of Feb. 3

ACCORDING to the *Wire Reports* for Feb. 3 and 4 issued by Science Service, the epicentre of the Cuba earthquake of Feb. 3 lay in about lat. 19.5° N., long. 76.5° W., or about thirty miles from Santiago, on the northern edge of the Bartlett Deep. At the time of the earthquake, Prof. S. Taber was in Santiago, studying the seismology of the district. He has found faults near Santiago so fresh that gullies made by rain have not yet crossed them. The U.S. submarine *S-48*, carrying an international scientific expedition, left on Feb. 4 to study the depths and changes of depth in the Bartlett Deep, an inquiry that may add to our knowledge of the origin of the recent earthquake.

Announcements

THE thirty-seventh annual congress of the South-Eastern Union of Scientific Societies will be held in London, at the Civil Service Commission, Burlington House, W.1, by permission of H.M. Office of Works, on June 1-4, under the presidency of Dr. R. E. Mortimer Wheeler, Keeper of the London Museum.

ON March 7, the Hon. Henry McLaren, president of the Royal Horticultural Society, will unveil a plaque at Messrs. Hatchards, 187 Piccadilly, London, to commemorate the foundation of the Horticultural Society of London at Messrs. Hatchards on March 7, 1804. The Society received its royal charter on April 7, 1809, becoming the Royal Horticultural Society.

AT the annual general meeting of the Quekett Microscopical Club, held on Feb. 9, the following officers and new members of the committee were elected: *President*—J. Milton Offord; *Vice-Presidents*—Dr. G. H. Rodman, J. Wilson, C. D. Soar, and J. Ramsbottom; *Hon. Treasurer*—C. H. Bestow; *Hon. Secretary*—W. S. Warton; *Hon. Reporter*—A. Morley Jones; *Hon. Librarian*—C. H. Caffyn; *Hon. Curator*—C. D. Sidwell; *Hon. Editor*—W. S. Warton; *New Members of Committee*—J. T. Holder, C. H. Oakden, H. C. Payne, J. Richardson, W. P. Sollas, and Dr. C. Tierney.