

it was established beyond doubt that the appearance of manna is a phenomenon well known in other countries under the name of 'honey-dew', which is a sweet excretion of plant-lice (Aphidæ) and scale-insects (Coccidæ). Two scale insects mainly responsible for the production of manna were found, namely, *Trabutina mannipara*, Ehrenb., occurring in the lowlands, and *Najacoccus serpentinus* var. *minor* Green, which replaces the former in the mountains. Two other Hemipterous insects, *Euscelis decoratus* Haupt and *Opsiurus jucundus* Leth., also produce manna, but to a lesser extent. All these insects live on *Tamarix nilotica* var. *mannifera* Ehrenb.; no manna was observed on other species of *Tamarix*, a fact probably due to some physiological peculiarities of the former. The authors observed the actual excretion by the insects of drops of clear sweet fluid, and proved by experiments that the fluid is ingested by the insects from the vessels of the phloem. When in an experiment a twig bearing the insects was placed in water, and the bark was cut below the insects, the production of manna continued in a normal manner, but it stopped as soon as the flow of carbohydrate solution from the leaves was interrupted by cutting off the bark above the insects. The dry desert climate of Sinai causes the syrup-like fluid excretion to crystallise, and the whitish grains thus produced, which cover the branches or fall to the ground underneath them, constitute the true manna of the Bible.

A chemical analysis of the manna demonstrated the presence of cane sugar, glucose, fructose, and saccharose; pectines were also found, but there was no trace of proteins.

Detailed descriptions of the manna insects are given in the report, which includes very good photographs of various stages of the production of the manna. Notes on the course of the expedition and on the fauna of the Peninsula of Sinai in general provide very interesting reading on that still practically unexplored country.

Fauna of the Batu Caves.

THE Batu Caves, near Selangor, were discovered in 1879, and the general character of the caves and their fauna was made known in 1898 by H. N. Ridley, and subsequent faunal records were made by Annandale and others. Mr. and Mrs. Cedric Dover have recently explored the caves, the total length of which is about 2500 feet, and their collection is the subject of a series of papers in the *Journal of the Federated Malay States Museums* (vol. 14, 1929).

The animals now reported upon include Mollusca, Crustacea, Nematoda (a new species of *Dorylaimus*), Arachnida, and seven orders of insects. Of the four molluscs, all gastropods, the genus *Opeas* was common throughout the cave, especially on damp boulders and on the walls, and both the species found (described as new) have eyes in which the pigment is small in amount or absent. Two isopod Crustacea are recorded—*Armadillo intermixtus* and *Philoscia dobakholi*—the latter, first described in 1924 from the Siju Cave in Assam, has "somewhat imperfect" eyes and a light colour.

The late G. O. Sars has given a detailed description of a new species of *Parabathynella* taken from a small pool about 900 feet from the entrance to the cave. These examples have seven pairs of well-developed legs and a rudimentary eighth pair, as contrasted with only five pairs of legs in the European specimens of *P. stygia* in which the three posterior trunk segments have no limbs—probably owing to their immature condition. Prof. Sars did not accept Dr. Calman's view that the Bathynellacea are Syncarida; he placed them in the division Anomotraca of the Malacostraca, and

regarded them as "very primitive forms, apparently constituting the still living remains of an antediluvian fauna". Their primitive characters include the uniform segmentation of the body, the sharp definition of the first segment of the trunk, and their primitive limbs, and it is suggested that the Bathynellacea are the predecessors of the Amphipoda.

The Arachnida include a Pedipalp, spiders of four genera, and a new species of the tick *Ornithodoros*. Among the insects recorded are two genera of blattids, a strongly pigmented new species of *Gryllotalpa* (the first mole-cricket to be found in a cave), an earwig, a Myrmeleonid, and five species of Microlepidoptera, one of which, a *Tinea*, is common in the cave and its larvæ are abundant in the bat guano. Of the ten species of Diptera collected, none shows any modifications for cave life. Two Reduviid bugs are recorded and a dozen beetles—none markedly modified for a cavernicolous habit. The discovery of many larvæ of beetles in the cave indicates that some at least of these beetles have found congenial conditions and are firmly established there.

University and Educational Intelligence.

LONDON.—The title of emeritus professor has been conferred on Dr. E. A. Gardner on his retirement from the Yates chair of archæology at University College, and on Dr. F. W. Oliver on his retirement from the Quain chair of botany at University College.

The following doctorates have been conferred: D.Sc. in chemistry on Mr. J. Bardhan (Imperial College—Royal College of Science), for a thesis entitled "I. The Chemistry of Balbiano's Acid; II. The Action of Cyanoacetamide with β -diketones"; Mr. K. Krishnamurti (University College), for a thesis entitled "Investigations on the Scattering of Light in Colloidal Solutions and Gels"; Mr. F. G. Mann (Battersea Polytechnic), for a thesis entitled "The Complex Metallic Salts of the Aliphatic Polyamines". D.Sc. in zoology on Mr. William Rowan (University College), for a thesis entitled "Experiments in Migration, including an Investigation of the Sexual Rhythm and Histology of the Gonads in Birds". D.Sc. in geography on Miss E. G. R. Taylor, for a thesis entitled "Studies in Tudor Geography, 1500–1583".

PORTSMOUTH Municipal College sends us a booklet issued on the occasion of the visit of H.R.H. Prince Arthur of Connaught on Dec. 9 in connexion with an exhibition commemorating the twenty-first anniversary of the opening of the college. Erected, equipped, and maintained by the Portsmouth City Education Authority, it serves the higher educational needs of a wide area surrounding the city, including the Isle of Wight and parts of Hampshire and West Sussex, whence come twenty per cent of the technical college students. It comprises departments of science, arts, technology (mechanical, civil, electrical, marine, motor, and other branches of engineering, building trades and pharmacy), commerce and domestic science, and, in addition, a school of art and a training college, affiliated to the University of Reading, for women teachers. It has thus, as pointed out in a foreword by the chairman of the governing body, the potential constituents of a university college. The work includes, on the technical college side, full-time academic courses leading to degrees of the University of London in arts, pure science, engineering, etc., and, more recently, in pharmacy and a wide range of other courses both full-time and part-time. The number of full-time students in this part of the College has increased from 66 to 507. The number of training college students has increased from 180 to 215.

COURSES in anthropology announced for the coming session in the University of Paris as usual cover a wide range, both in general subjects and in departmental studies. For the diploma and certificate in ethnology, M. Mauss lectures on descriptive ethnography, M. M. Cohen on descriptive linguistics, M. Rivet on physical anthropology, and L'Abbé Breuil on "Préhistoire exotique". There are also special courses on the ethnography and linguistics of Africa and further Asia, zoological and biological anthropology, quaternary geology and palæontology, and the psycho-physiology of man and the anthropoids. Practical instruction in each course is given in museums. Courses given at the constituent bodies of the University are as usual grouped under ethnography, sociology, human geography, prehistoric archaeology, linguistics, and phonetics, physical anthropology and palæontology. The course in linguistics is specially varied, and the lectures have obviously been arranged with the requirements of French colonial administration in view. They include Annamese, Siamese, Cambodian, Amharic, Lao, Malay, Malagasy, the languages of Modern India, and Arabic. Among the courses in ethnography may be noted one which will deal with the folklore of medieval western Europe and the formation of the Ossianic cycle from popular legend (M. Marx), and one by M. Mauss on the belief in the efficacy of the spell in Australia and the relation of myth and rite in New Guinea. The civilisation of Central America and Peru will be dealt with by M. Raynaud, and M. Cabaton covers the Malay Peninsula and Indo-China.

THE Rhodes scholarships statement for 1928-29 shows that of 181 scholars in residence, namely, 96 from within the British Commonwealth and 85 from the United States of America, 58 were pursuing studies in law, 34 in natural science and medicine, 25 in English literature, 19 in philosophy, politics, and economics, 10 in Lit. Hum., 8 in mathematics, 7 in economics, and 10 in other schools. It will be noticed that a large proportion (32 per cent) of the scholars elected to study law. Moreover, this preference seems to have been most marked among the more brilliant, and especially so among the Americans. Seven out of twelve and seven out of thirteen who gained, respectively, first and second class honours, did so in the school of jurisprudence, the remainder being distributed as follows: natural science 5, modern history 3, philosophy, politics, and economics 2, and English 1. Of the eight American scholars who took firsts, six were in the school of jurisprudence. Most of the higher degrees and first and second class honours were won by scholars from the United States, as was only to be expected, having regard to the wealth of academic resources and the extent of the field of selection in that country as compared with those in the British Empire overseas. The statement includes interesting notes *de mortuis* and particulars of honours and appointments obtained by former scholars, and of new books published by scholars. A former German Rhodes scholar is actively and prominently engaged in political life in Germany as a member of the Nationalist group in the Reichstag. A notable event of the year was a gathering in Oxford last July of old Rhodes scholars to celebrate the twenty-fifth anniversary of the inauguration of the scholarships. The celebrations lasted from July 4 until July 11. Old Rhodes scholars to the number of 190, 99 of whom were accompanied by their wives, were present. The central event was a dinner in Rhodes House on July 5 (the seventy-sixth anniversary of the birth of Cecil Rhodes), at which H.R.H. the Prince of Wales was present, with Mr. Stanley Baldwin in the chair.

Calendar of Patent Records.

December 28, 1871.—Antonio Meucci is an Italian claimant to the invention of the telephone. Meucci settled in the United States in 1851, and worked at his invention for many years, an attempt being made to start a 'Teletrophone Company', though this did not attract more than a few dollars of public support. A caveat for the invention was lodged in the United States Patent Office on Dec. 28, 1871, but was not taken up and lapsed at the end of the following year. Bell's patent was applied for in 1876.

December 30, 1775.—John Arnold, the London watchmaker, invented the cylindrical helical form of balance-spring for chronometers and received a patent for the invention on Dec. 30, 1775. A watch with the new spring was sent to Greenwich for an official trial in 1779, and successfully withstood all tests for a period of 13 months. Its total error during this period was only $2\frac{1}{2}$ minutes, whilst its daily rate never varied by more than 3 seconds.

December 30, 1797.—The self-acting hydraulic ram was first invented by Joseph Michel Montgolfier, the celebrated pioneer of ballooning, and patented in England in the name of Matthew Boulton on Dec. 30, 1797, the French patent not being granted to Montgolfier until six months later. The principle of the hydraulic ram had been first used for raising water by John Whitehurst of Derby, who sent a description of his apparatus to the Royal Society in 1770, detailing its application to a domestic water supply in which every time the tap was turned on and off in the kitchen a column of water was forced into a tank in the upper part of the house. The value of the apparatus for water-raising purposes was not recognised, however, until Montgolfier's invention.

December 31, 1562.—The first patent in the English records for a machine for the draining of mines was granted for twenty years to John Medley on Dec. 31, 1562. The grant recites that "in oure counties of Cornewall and Devon as in diverse other places of oure Realme of England there be diverse mynes as well of tynne leade and other mettall as of sea-cole whiche through the greate habundance of waters rysinge in the same are drowned and altogether unoccupied", and that Medley has made "an engyne or instrument for the draynyng of waters not heretofore used in this oure Realme". It was the dependence of the mining industry on adequate water-raising devices that led to the invention of the steam engine.

December 31, 1790.—From the sixteenth century onwards patents for invention were granted intermittently by the French kings, but the first legislative enactment in France came into force in 1791, the Decree of the Assembly having been passed on Dec. 31, 1790. The first patent under the new law was granted in July 1791, and thirty-four were sealed before the end of the year.

December 31, 1842.—In the early days of the semaphore railway signal, which was introduced in England about 1841, many suggestions were made for combining it with a lamp for night signalling. Rudolf Treutler, who obtained a Prussian patent for six years for his invention on Dec. 31, 1842, proposed to attach to the semaphore arm a series of small mirrors all disposed in such a manner that they reflected the light from a lamp straight down the railway track for all positions of the arm, and thus illuminated the arm so that it was visible at considerable range. The arrangement was first used in 1844 on the Breslau-Freiburg railway and was adopted on a number of the Saxon lines, where it remained in use for many years.