

this disease. So long ago as 1887 an Army medical officer discovered that Malta fever is caused by the entrance into the body of a minute bacterium, which was named the *Micrococcus melitensis*. This microbe was studied from many points of view, but with no success until a discovery was made which cleared up the mystery. This was the remarkable fact that the goats in Malta are susceptible to this disease, and act, as it were, as a reservoir of the virus. In truth, it is probable that Malta fever is primarily a disease of goats, and that man is infected from the goat, not the goat from man. The goat is very much in evidence in Malta, there being some 20,000 of them, which supply practically all the milk used in the island. It was discovered by the commission that half these animals are affected by Malta fever, and that one-tenth are constantly passing the *Micrococcus melitensis* in their milk. Notwithstanding that the goats show no outer signs of the disease, they continue, possibly for years, to secrete milk containing the poison.

It seemed evident, then, that to banish Malta fever from our sailors and soldiers on the station, all that was required was to eliminate goats' milk from their dietary. This step was taken in June, 1906, with the striking result that the cases of fever fell to one-tenth of what had been their normal number. There is, therefore, reasonable hope that this disease will now disappear from the garrison in Malta, and some 80,000 days of illness be blotted out from the yearly records of the Navy and Army.

If these good results are maintained, this investigation will stand out as one of the most notable examples of successful work in the prevention of disease, and will clearly show the economy of spending a few thousands on a thorough scientific investigation.

The research occupied some time, and from first to last employed some twelve men, but the outlay in time and money are as nothing to the result achieved.

INTERNATIONAL ASSOCIATION OF ACADEMIES.

YESTERDAY morning, May 29, there opened at Vienna the third triennial general assembly of the International Association of Academies; of which the Imperial Academy of Sciences, Vienna, has been the directing academy for the last three years.

Great Britain is represented in this association by the Royal Society of London in the section of natural science, and by the British Academy for Historical and Philological Studies in the section of letters.

The delegates appointed to attend the assembly on behalf of the Royal Society are Sir George Darwin, K.C.B., Sir Norman Lockyer, K.C.B., Lieut.-Colonel Prain, Prof. Schuster, Dr. W. N. Shaw, Prof. C. S. Sherrington, Prof. H. H. Turner, and Dr. A. D. Waller, Prof. Schuster being the delegate charged to deliver the vote of the society; while the British Academy is represented by Prof. Bywater and Prof. Israel Gollancz.

A number of subjects of general scientific importance will be discussed at the meeting, as well as certain questions of internal policy concerning the status of the association, and its mode of working under its statutes.

The Royal Society has put forward two proposals for the consideration of the assembly. One is for the establishment of a uniform lunar nomenclature, and a proposition will be submitted by the council of the association for the appointment of a committee to work out a scheme in furtherance of this object. In this connection the Royal Society propounds sugges-

tions regarding the coordination of lunar nomenclature, which will no doubt form a basis for discussion.

Another proposal of the Royal Society for the co-operation of the International Association in the International Union for Solar Research will probably lead to considerable discussion, not on account of want of sympathy with the movement, but because of questions which have been raised as to the constitutional power of the association to join another organisation.

An important proposal of the Académie des Sciences to create an organisation of meteorological stations at different points on the earth's surface, at the expense of the Governments respectively concerned, will be put forward with the support of the council of the association.

The assembly will also be recommended to approve the resolutions of the committee which met at Frankfurt-am-Main in 1904, proposing changes in the statutes of the International Seismological Association, which have since been adopted. That committee recommends the associated academies to endeavour to induce their Governments to cooperate with the International Seismological Association in dealing with seismic problems of physical interest.

Other matters to be brought before the assembly in the science section are a report of the committee for investigating the anatomy of the brain; reports upon geodetic measurements; a report of the commission appointed in 1904 for the investigation of atmospheric electricity; the consideration of the further working of the committee appointed in 1904 for the magnetic measure of a circle of latitude.

In the section of letters there will be reports presented upon the edition of the works of Leibnitz, initiated by the association; upon the international loan of manuscripts; upon the edition of the Mahabharata; the publication of an Encyclopædia of Islam; the Corpus of Greek records and the Corpus medicorum antiquorum.

THE SMALL PLANETS.¹

M. MASCART'S summary of his own work is as follows:—

Nous avons voulu montrer l'ampleur de la question des petites planètes, qui ne fut jamais encore exposée dans son ensemble, et si nous nous sommes suscité bien plus de points d'interrogation que nous n'en avons levés, nous serons du moins heureux, peut-être, d'appeler l'attention des astronomes sur quelques problèmes assez mystérieux.

Probably an author has seldom given in few words so excellent and accurate a description of his work. M. Mascart has collected on a large scale, and has thus performed a great service to this branch of astronomy. We may turn to his bibliography containing more than a hundred names with a reasonable confidence that nothing of importance has been omitted.

The subject of the small planets appears to bristle with striking statistical peculiarities. To exhibit their nature we note down a few, and may remark that perhaps in no case whatever has a completely satisfactory explanation been given.

(1) If the small planets be arranged in order of mean distance, or of mean motion, there are marked gaps in the series, first noticed by Kirkwood, corresponding to mean motions twice and three times that of Jupiter.

(2) When the inclination to the ecliptic is large, so also, in general, is the eccentricity, and *vice versa*.

¹ "La Question des petites Planètes." By M. J. Mascart. Pp. 110.

(3) Occasionally there are striking similarities in the elements of two planets, e.g.

(251) Sophie ... $3^{\circ}10' \dots 0^{\circ}09' \dots 10^{\circ}29' \dots 157^{\circ} \dots 80^{\circ}16'$

(918) Magdalena.. $3^{\circ}19' \dots 0^{\circ}07' \dots 10^{\circ}33' \dots 163^{\circ} \dots 80^{\circ}5'$

The resemblance of the elements in the case quoted is far closer than is reasonably probable, even for a selected pair out of several hundred planets. We, however, are much inclined to doubt whether it is more than an accident. A famous case of coincidence is that between the periods of rotation and revolution of the moon. Here there is a controlling cause tending to produce equality, and the equality is exact. Now in the case of the elements of Sophie and Magdalena, we suppose that there are only three possible hypotheses:—(i.) accidental resemblance; (ii.) a cause tending to produce similarity; (iii.) a common origin with no subsequent connection. We may take as analogies:—(i) two watches that have run down, but happen by accident to show nearly the same time; (ii.) two clocks synchronised with each other; (iii.) two clocks, each constructed with the same object of exhibiting mean time, but entirely independent of each other subsequently. Now, as regards (ii.), we may remark that in the present instance the supposed controlling force has done its work very imperfectly. The objection to (iii.) is that a common origin hypothesis can only be applied in a few isolated cases, of which the above is one, and therefore we ourselves feel inclined to fall back upon (i.), the hypothesis of accidental resemblance, although we fully admit its antecedent improbability.

In the early part of the book an estimate is given of the total mass of the asteroids. It would appear that the entire mass is very far short of a quarter of the mass of the earth, very far short indeed of the mass that would have been expected if a single planet had filled the gap in Bode's law between Mars and Jupiter.

In a few cases approximate linear dimensions are given, founded on measures by Barnard in 1894.

We must congratulate M. Mascart on a very interesting and exhaustive work. We regret, however, the absence of a complete list of all known asteroids with their elements. We should have been glad to have seen such a list in several different forms, with the small planets arranged in order of mean motion, eccentricity, longitude of perihelion, and in the various other ways mentioned in the book. It would have enabled us to follow the arguments from statistics with greater appreciation, and the value of the book as a work of reference would have been much increased. The work admirably fulfils the design of the author.

SIR BENJAMIN BAKER, K.C.B., F.R.S.

SIR BENJAMIN BAKER, whose sudden death in his sixty-seventh year we recorded last week, had a distinguished career as an engineer, and was concerned more or less directly with most of the great engineering schemes of recent years. By his death the profession of civil engineering is deprived of one of its leading members, and the scientific world of a man who combined scientific knowledge with practical training and experience. He was a constant contributor to early volumes of NATURE, and his writings and addresses cover a wide field of applied science.

Sir Benjamin Baker was born in 1840, and for the last thirty years or so was engaged in the design and construction of important engineering works at home and abroad. He carried out numerous investigations

relating to the strength of materials and of engineering structures generally, and contributed papers thereon to various scientific societies. He was the author of "A Theoretical Investigation into the Most Advantageous System of Constructing Bridges of Great Span," upon which plan the Forth Bridge and six of the largest bridges in the world have been built.

His name will be remembered chiefly in connection with the Forth Bridge and the great dam across the Nile at Assouan. On the completion, in 1890, of the former engineering feat Sir Benjamin Baker was made K.C.M.G., and when the dam at Assouan was finished in 1902 he was made K.C.B., and received at the same time the first-class of the Order of the Medjidieh from the Khedive. Two years ago plans were submitted to him for the raising of the Assouan dam, and since then he had worked more or less continuously at the subject of stresses on dams. A note by him upon the project appeared in the Earl of Cromer's recent despatch respecting the water supply of Egypt; and in it he stated that a design had been evolved which satisfied all the theoretical and practical conditions, and rendered the storage of nearly two and a half times the present quantity of water in the reservoir a simple problem.

Though his name will always be associated first with the famous works mentioned, Sir Benjamin Baker took a very active part in other great engineering enterprises in many parts of the world. He had much to do with making the Metropolitan Railway, and was associated more recently with the construction of the various tubes for electric traffic under London.

Sir Benjamin Baker was elected a Fellow of the Royal Society in 1890, and in 1895 he became president of the Institution of Civil Engineers. Honorary degrees were conferred upon him by the Universities of Cambridge and Edinburgh, by the Irish Academy, and other learned bodies. He was closely associated with the various engineering societies, and was actively interested in the work of the British Association and the Royal Institution. He was a member of the council of the Institution of Mechanical Engineers, and an honorary member of the American and Canadian Societies of Civil Engineers, and the American Society of Mechanical Engineers. His unexpected death will be deplored wherever pure and applied science are studied, and his personal friends have suffered a loss that cannot easily be realised by those who did not know his broad interests and sympathetic nature.

NOTES.

THE Senate of the State of Pennsylvania has voted 70,000 for the American Philosophical Society to provide a fitting memorial to Benjamin Franklin.

SIR WILLIAM RAMSAY, K.C.B., has received through the Foreign Office the Order of Commendatore della Corona d'Italia from the King of Italy, together with King Edward's permission to wear it.

At the anniversary meeting of the Linnean Society on May 24, the Linnean medal, awarded by the council to Dr. Melchor Treub, director of the State Botanic Garden at Buitenzorg, Java, was formally handed to Mr. Van Royen, councillor of the Netherlands Legation, who undertook to transmit the medal to Dr. Treub.

MR. ANDREW WATT has been elected meteorological secretary of the Scottish Meteorological Society in succession to the late Dr. Buchan, F.R.S. Mr. Watt has since 1900 been closely associated with Dr. Buchan in the discussion of rainfall and other important meteorological problems.