these be confirmed, is unusually slow, a maximum of 65 feet a year.

The Wenkchemna receives the name of a Piedmont glacier, rather on the Bottom's dream principle, for, though formed by the lateral union of several short ice-streams (called "commensal" because they are fed from different sources), they come to an end high up in a mountain valley. The Yoho glacier, on the west side of the divide, is split into two by a rocky rib at its lower end, and is unusually free from surface débris. The Illecillewaet glacier, best known of those in the Selkirks, with its steep cascade of shattered *séracs*, forms an imposing feature in the landscape, but, as a comparison of the accompanying figures plainly shows, retreated considerably between 1888 and 1905. The Asulkan glacier is the smallest and most southern of the five, but is nevertheless a fine object.

Lakets, moraines, and other "leavings" of the ice show that all these glaciers have retreated in comparatively recent times, but more facts must be gathered before the periodicity of their movements can be ascertained. It is, however, as Dr. Sherzer points out, not unlikely to agree with the approximate thirty-five and a half years already inferred for other districts, and we may notice in passing that in these mountains the "Chinook" wind is a substitute for the Alpine "Föhn." He claims for glaciers a certain amount of erosive action—the scooping out of small lake-basins in favourable circumstances, and the conversion of valleys in their lower parts from V-shaped into U-shaped. The latter may be; but we cannot help remarking that in the Alps, where the ice at equal distances can hardly have been less in quantity, it seems to have been singularly incapable of effacing any pre-existent feature of importance. Dr. Sherzer also claims that ice can exercise a plucking action, but apparently only when passing over a much-jointed quartzite. Obviously, this would be the worst possible material for making *roches moutonnées*, but even here we should like a little more proof that the glacier has mastered the "art of pluck."

The so-called "bear den" moraines—piles of coarse broken rock without the usual infilling of fine material—seem to be one of the more exceptional features of this region. Dr. Sherzer regards them as records of "landslides" upon the ice from the higher peaks. That would explain their structure, but we doubt whether an earthquake is needed to start a "berg fall." Not to mention earlier instances, those near Elm in the Sernfthal and from Turtle mountain in Alberta occurred without any seismic disturbance. The prismatic structure in "ice dykes" is also remarkable, and recalls that exhibited in *glacières* and pond-ice—a subject once much discussed, among other places, in the first and second volumes of NATURE. On the whole, though sometimes, perhaps, a little too diffuse in describing the well-known, Dr. Sherzer has made a valuable and remarkably well-illustrated contribution to the literature of glaciers.

T. G. BONNEY.

THE FORTHCOMING MATHEMATICAL CONGRESS AT ROME.

AS was announced in NATURE for February 6, the fourth International Congress of Mathematicians will be held at Rome in the week before Easter. The congress meets once every four years, the previous places of meeting being Zürich, Paris, and Heidelberg. On this occasion the order of proceedings will be as follows:—

Sunday, April 5; Reception at the Aula Magna by the principal of the University, at 9.30 p.m. Monday, April 6: Inaugural meeting at 10 a.m. at the Capitol, at which Prof. Volterra will read a discourse on Italian mathematics in the last half of the nineteenth century. At 3 p.m. a general meeting will be held at the Reale Accademia dei Lincei for the election of a president and for the award of the Guccia medal, followed by two lectures. From Tuesday, April 7, to Saturday, April 11, the congress will meet in four sections every morning at 9 a.m., the subjects of the sections being (1) arithmetic, algebra, and analysis; (2) geometry; (3) applied mathematics; (4) philosophy, history, and teaching of mathematics. In the section of applied mathematics the subject of actuarial mathematics will be introduced by Prof. Toja for the first time at these congresses. On each of the afternoons of April 7, 8, and 10, two lectures will be given, commencing at 3.30 p.m. Thursday, April 9: Visit to the Palatine by invitation of the Minister of Public Instruction, at 3 p.m. Saturday, April 11: Concluding general meeting; arrangements for date and place of next congress. Ninth and tenth lectures. Sunday, April 12: Visit to Hadrian's villa and lunch at Tivoli.

In addition, a reception will be given by the municipality in the museum of the Capitol on some evening during the week.

The lectures arranged are as follows:—Darboux (infinitesimal geometry), Forsyth (partial differential equations of the second order), Hilbert (method of infinite number of independent variables), Klein (the "Mathematical Encyclopædia"), Lorentz (partition of energy between matter and ether), Mittag-Leffler (representation of functions of a complex variable). Newcomb (lunar theory), Picard (analysis and mathematical physics), Poincaré (subject to be announced). Veronese (non-archimedean geometry).

From March 25 to May 5 the Italian State railways will issue tickets at reduced fares to those attending the congress from the frontier stations, as well as for ten separate journeys in any part of Italy. In addition, all members are granted free admission to the principal museums and galleries in Rome between April 1 and April 12. The subscription is fixed at 25 lire (*il.*) for members, or 15 lire for those belonging to the family of a member who desire to enjoy the same privileges; but to obtain railway vouchers for the outward journey subscriptions have to be received before March 25 by the treasurer, Prof. Vincenzo Reina, 5 Piazza S. Pietro in Vincoli, Rome.

From the point of view of the English mathematician, the time fixed for the congress this year is somewhat inconvenient, as those who attend will doubtless wish to see something of Rome at the same time, and not only are our Easter vacations, as a rule, very short, but in many cases they do not even cover the period fixed for the congress. These difficulties could have been obviated by holding the congress at its more usual time in the summer vacation, and had this been done no inconvenience would probably have been experienced from the heat, though some people might have been deterred from attending owing to fears in this respect. In view of the fact that only seven Englishmen attended the last congress, it is important that everyone who can attend should do so this time, even if this involves an extension of their holiday beyond the ordinary limits of the school or college vacation. It would be a great pity if anyone were debarred from attending these gatherings merely for the sake of a week's teaching to a class of elementary pupils, and it is to be hoped that the governing bodies of our schools and colleges will not allow such small obstacles to stand in the way of their mathematical representa-

tives being present on such occasions. Otherwise there is a danger of their mathematical teaching running into a narrow groove. In regard to future meeting-places of the congress, this matter is, of course, decided at the final meeting in April, but it may not be out of place to express the hope that the congress of 1912 will be held somewhere within the British Isles. G. H. BRYAN.

PREHISTORIC CHEMISTRY.

ANCIENT Egypt always exercises an intense fascination for the student of the past, particularly as its written records are amplified by its "human documents" in the shape of mummies. This interest has, during the past few years, been intensified by the valuable series of anatomical studies on mummified remains which have issued from the Government School of Medicine at Cairo under the auspices of Prof. Elliot Smith. Not the least important of these is from the pen of Mr. W. A. Schmidt,[1] who has investigated mummified material of different epochs from the chemical and biological point of view. Some of the mummies he worked with carry us back to prehistoric periods, 6000 years ago, before the art of embalming as practised in later times was known to the inhabitants of the Nile valley.

It is remarkable that, in spite of this lapse of time, organic materials, which of all others are liable to decay, should still manifest in the test-tube their characteristic reactions. The presence of solid and volatile fatty acids, proteins, and cholesterin, with traces of intact fat, was demonstrable. The high percentage of fatty acids leads the author to the conclusion that they originate, not wholly from fat, but mainly from the body proteins. The formation of adipocere in the muscles of corpses left in water or buried in damp soil was adduced by the French observers in their work at the Morgue in Paris as evidence of the possible conversion of protein into fatty material. At the present time, however, the doctrine of the metabolic change of protein into fat is regarded with scepticism by most physiologists, in spite of the large amount of fatty acid radicals in the protein molecule.

The mummy protein, although it retains the general characters of albuminous material, has lost those specific properties which enable us to distinguish that of human origin from that which is found in other parts of the animal kingdom. In other words, it no longer gives what is termed the "biological reaction." This is disappointing, although it was doubtless expected. Mr. Schmidt also found that he could no longer detect hæmoglobin, and the substance regarded as blood by previous observers was doubtless composed of coloured gum and resin employed in embalming. In reference to the process of embalming itself, he was unable to find any soda; the so-called natrium bath really consisted of a solution of common salt. The old Egyptians simply pickled their corpses in brine, and the various balsams used were mere accessories which could have exerted no real influence on the process of mummification. The real agent at work here was undoubtedly the extraordinarily dry climate of Egypt, and it is this also which has acted as a preservative of the organic material which can still be identified.

The research reminds me of a small piece of work which was carried out by Dr. Otto Rosenheim[2] in my laboratory a few years ago. Small pieces of the carapace of a fossil Eurypterid were placed at his disposal by Sir E. Ray Lankester and Mr. Bather, of the Natural History Museum, and he was able to demonstrate in them the presence of chitin, their organic substratum. In this case one was dealing with prehistoric material compared with which an Egyptian mummy is quite recent. This kind of work appeals to the imagination, and one can only hope that if it is continued, still further light and interest will be thrown on the records of past ages.

W. D. HALLIBURTON.

[1] "Chemische und biologische Untersuchungen von ägyptischen Mumienmaterial, nebst Betrachtungen über das Einbalsamierungsverfahren der alter Ägypter." (Published in Max Verworn's *Zeitsch. f. allg. Physiol.*, vol. vii., pp. 369-392, 1907.)

[2] "Chitin in the Carapace of the *Pterygotus osiliensis* from the Silurian Rocks of Oesel" (Proc. Roy. Soc., vol. lxxvi., B, pp. 398-400, 1905).

DR. H. C. SORBY, F.R.S.

ON March 9, Dr. Henry Clifton Sorby, F.R.S., died, aged eighty-two, at his residence in Sheffield. The news of his death, although not unexpected, was received in the city of steel with profound regret, and those who had had the privilege of knowing Dr. Sorby felt that science had lost one of her greatest sons and that Sheffield must now look back upon "another yesterday." It is a little difficult for many of the inhabitants of "steelopolis" to realise that never again can they see the familiar figure hurrying along with bowed head, or the grave face, with, in its eyes, that far-off look which sees things beyond the ken of most men.

It is more than a little sad for those who could venture to intercept him with a "Good morning, Doctor," to know that never more can they receive his semi-startled, ultra-courteous recognition and hearty handshake, or again hear the cheery, almost laughing "*Good* morning. How are you?"

Combined with a complete absence of self-consciousness, two great personal characteristics of Dr. Sorby (which much handicapped him from the worldly point of view of non-scientific honours) were modesty and an immovable love of truth. The characteristic last named somewhat dimmed the brilliancy and lucidity of his papers, since in an enunciation he could never bring himself to omit any possible or even improbable qualification concerning the accuracy of the particular theory he happened to be formulating from his observed facts.

As a speaker Dr. Sorby could not claim to be an orator, but he had, nevertheless, a peculiar style all his own, by means of which he fully conveyed his meaning to his sympathetic audiences. Dr. Sorby belonged to a past generation of men of science the like of whom the world will do well to breed again. He loved science for her own sake, but so far from holding the view that science applied was science degraded, his almost child-like pleasure on hearing that some of his discoveries had been of practical use in the great workaday world was good to see. Dr. Sorby was not a family man, and though in easy circumstances he laboriously devoted his life to scientific research. The fact that those services to science were never adequately rewarded remains a permanent disgrace to the powers that be.

Turning from personal matters to the works of this great man of science, the writer is confronted by the fact that he must attempt the impossible task of compressing into a few hundred words an account of the labours of a versatile genius spread over a period of nearly sixty years, and embodied in about 240 papers, a number which, taking into consideration the length of Sorby's scientific life, corresponds to an average of four papers *per annum*.

His first research on sulphur and phosphorus in agricultural crops was published in 1847; his last paper on geology was written a few months before his death.