

Oligocene (Tongrian). The youngest beds in the area are gravel terraces, lacustrine clays, deposited on the bed of the ever-diminishing lake, sands blown from the desert, and alluvial deposits.

Mr. Beadnell adduces evidence in favour of the view that the bodies of the animals the skeletons of which are found entombed in the strata of the Fayum were brought down from the African interior by a great stream which flowed in a north-westerly direction, passing through the ancient lake occupying the site of the Baharia Oasis. At that period the shore-line would be near the Fayum, and the Nile would flow into the sea near the same point.

In historical times, as is well known, a large part of the Fayum was occupied by the ancient Lake Moeris. By successive reclamations of the alluvial lands, this lake has probably been reduced to less than one-eighth of its original area, and now constitutes the comparatively insignificant Birket el Qurun.

The work before us appears in the same excellent form as the other memoirs of the Geological Survey of Egypt, issued under the direction of Captain

among the latter there are many examples that have been shown in the society's previous exhibitions.

Of the new work, the natural history section is by far the best represented. Miss Turner's set of photographs of the "great crested grebe," and a series of twenty-two lantern slides of butterflies by Dr. D. H. Hutchinson, have been awarded medals. The lantern slides are by the Sanger-Shepherd three-colour process, and illustrate the usefulness of this method for recording rare varieties. In some of the slides the colours are notably excellent, perhaps as perfect as any mechanical colour process will ever produce. Some of the photographs of "nesting swans" by Mr. Douglas English must have been taken at considerable risk, for in two or three of them the bird is shown flying at the photographer in anger. Another example (No. 237) will be found in the west room among the pictorial photographs, and close by (No. 216) is a very fine photograph of sea-gulls, the foremost of which are in the act of alighting on the water. Of other photographs that record slower movements, the chief are a series of seven by Mr. W. Farren of the "skin moult of the caterpillar of the privet hawk-moth," a series

of eight photomicrographs ($\times 30$) by Mrs. Kate J. Pigg showing the germination of a grass seed, and two photographs of the same oak, the one taken more than fifty years before the other, by Mr. J. B. Hilditch. The earlier photograph of the oak was exhibited at the first exhibition of the Royal Photographic Society (then the Photographic Society of London), and is at least as good a piece of work as the later, the main difference from a technical point of view being that the exposure necessary for the first was three thousand times as long as that given for the second. There are many other photographs of living things, but the bee photographs of Mr. Oliver G. Pike deserve special notice. The difficulty was to get light enough without causing the bees to stop their work, and Mr. Pike has succeeded.

Of other work in the technical section there are photomicrographs showing the structure of various metals and alloys by Mr. E. F. Law, some interesting wave photographs by Dr. Vaughan Cornish, and a number of radiographs by Dr. Thurstan Holland which well illustrate the possibilities of modern methods. The only "natural colour" photograph that we discovered, other than the transparencies by the Sanger-Shepherd method, is a three-carbon print by Mr. Brewerton. We think he has sent as good examples in previous years, but whether or not, what we want to show the capabilities of three-colour work are the finished print, produced without handwork, by the side of the object or painting that it represents. Some commercial work is excellent, but its measure of perfection is due to retouching.

The loan collection from the St. Louis Exhibition will doubtless prove more interesting to many than the new work, because of its greater variety. Some of these exhibits are of historic interest, such as Sir William Abney's photograph of the spectrum in the infra-red, and General Waterhouse's examples of photomechanical work. There are a very great many



FIG. 2.—Bahr Yusuf at Lahun before entering the Fayum. From "The Topography and Geology of the Fayum Province of Egypt," by H. J. L. Beadnell.

Lyons. There are sixteen plates reproduced from photographs, which give a good idea of the scenery of this wonderful district. We give reductions of two of the plates. In addition to these, there are two geological maps and six sheets of longitudinal sections. There are also woodcuts in the letterpress. The printing of the text of the work and the execution of the illustrations are highly creditable to the Survey Department at Cairo.

J. W. J.

THE ROYAL PHOTOGRAPHIC SOCIETY'S EXHIBITION.

THE fiftieth annual exhibition of the Royal Photographic Society is now open. There is a distinct and regrettable falling off in the number of exhibits in the section devoted to scientific and technical photography, but this is in a measure compensated for by the presence of the loan collection of British photographs of a similar kind that was sent to the St. Louis Exhibition last year, though

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photomicrographs of etched metals and alloys, some astronomical and spectrum photographs, and Mr. Edgar Senior's photomicrographs of sections of photographic films, including those of colour photographs by Lippmann's process which demonstrate that the silver deposit is in layers.

In the trade section there are many interesting exhibits. Doubtless the greatest novelty is the demonstration of the three-colour process called "pinatype," which is claimed to be the amateur's method of colour printing on paper. Three prints in chromated gelatin are made from the ordinary three transparencies, and these are each caused to absorb its proper colour by soaking it in the proper dye solution. The prepared paper that is to bear the print is squeegeed on to each of these coloured "print plates" in turn, and duly absorbs the colour. Thus the three colours are absorbed into a single film. The examples we saw were of various degrees of merit.

PROF. LEO ERRERA.

LEO ERRERA, professor of botany in the University of Brussels and member of the Royal Academy of Belgium, whose death on August 1 has already been announced, was born in 1858. He merited preeminently the title of professor, for not only was he gifted as few men are gifted with the faculty of giving a clear and precise explanation of complicated problems, and of impressing upon the minds of his hearers his conclusions, which were well reasoned and supported by facts and conceptions, but he was also one of those teachers who recognised that it is not possible to improvise a lecture, however simple or commonplace, without bestowing upon it lengthy and conscientious preparation. In addition to the critical judgment which characterised his teaching, he always kept it abreast of scientific knowledge; each year, even in the case of his elementary courses, his lectures were looked through, revised, and brought up to date so as to include the latest results in the subject.

Prof. Errera was one of the first teachers in Belgium who had the courage to declare that practical work should take precedence of theoretical studies, which alone had formed the ordinary courses up to that time. He was convinced that a student should only accept as true what he had verified for himself, and that it is not sufficient to know scientific results without becoming acquainted with the methods employed. With this object he established in 1884, when he was appointed professor in the university, the laboratory for vegetable anatomy and physiology which became later the Botanical Institute.

He was wonderfully assisted by the remarkable facility with which he assimilated all current literature. He read Danish and Swedish without any difficulty, and at the congresses in which he took part, whether English, German or Dutch, he invariably excited admiration by his correct and expressive rendering of foreign languages. It was not surprising that at the International Botanical Congress held at Vienna last June he was nominated president for the next congress, to be held at Brussels in 1910.

The worries of teaching did not cause Errera to forget that it is the duty of every scientific man to contribute to the increase of that knowledge which has been handed down to him. His energy was especially productive along four lines of research.

When Darwin had attracted attention to the importance of cross-fertilisation among plants and to the part played by insects in the transfer of pollen, Errera as early as 1878, recognising the full import of this

discovery immediately set to work to study with his keen experimental insight the genera *Penstemon* and *Primula*, and *Geranium phaeum*.

Later, while he was working in De Bary's laboratory at Strasbourg, he discovered in certain fungal cells a substance then unknown which gave all the reactions of glycogen. This is a body allied to starch that was conclusively shown by the great Claude Bernard to be of great importance in animal physiology. By degrees Errera recognised glycogen in all the groups of fungi, and was able to assign to it the same function, *i.e.* that of reserve carbohydrate, as it has in animals. His first researches on this subject were published in 1884, and constituted his thesis for admission into the University of Brussels.

Prof. Errera initiated a series of papers on the rôle of alkaloids in plants. The origin and rôle of these poisons in plant economy formed, and still forms, the subject of discussion. The papers of Errera and his pupils tend to prove that alkaloids are decomposition products of nutrition, but that they may be utilised by plants as a defence against herbivorous animals.

He was one of those who realised the importance which attaches to molecular forces in the structure of living beings and in all the obscure phenomena of nutrition. Basing his investigations primarily on the important works of the physician Joseph Plateau, the illustrious professor of the University of Ghent, Errera showed that cellular membranes behave in the same way as if they obeyed the laws which regulate the reaction of liquid films such as are produced in blowing soap-bubbles. His first communication on this subject dates from 1886.

But not content to lead the way in the domains of science which we have outlined and to direct the work of his students therein, he also pursued many investigations in very diverse subjects. He did much to improve the methods of microscopical technique; he simplified greatly the microchemical examination of certain substances; he published ingenious theories on the mechanism of sleep, and contributed lectures on widely different subjects varying from pedagogy to natural philosophy; and all his publications were marked by a clearness and purity of style that are not surpassed in the writings of any other man of science.

JEAN MASSART.

NOTES.

MR. G. B. BUCKTON, F.R.S., author of several monographs on entomological and other subjects, died on September 26, at eighty-eight years of age.

WE regret to see the report that Sir William Wharton, who was prevented by illness from leaving Cape Town with other members of the British Association last week, is suffering from enteric fever complicated by pneumonia. His condition on Monday showed a slight improvement.

AN earthquake shock was felt in Stirling, Dollar, and Alloa shortly before midnight on Thursday, September 21. The shock travelled in a similar direction to that of July 23, namely, to the south-east, but it was of slightly longer duration and more violent in character. In Stirling pictures and crockery were shaken and articles of furniture moved, and a sound like thunder was heard. At Corton railway signal-cabin all the bells were set ringing. At Bridge of Allan the shock was felt very decidedly. In Bannockburn and in the neighbouring villages the impression was of a serious explosion. Comrie was only slightly affected: a low rumbling sound was heard, but no damage was done.