they originally had been thrown up by a volcanic eruption.

Considering next the action of the finest and therefore most persistent dust on solar-radiation, he finds that the "interception of outgoing radiation is wholly negligible in comparison with the interception of incoming solar radiation."

Prof. Humphreys now turns his attention to the observational evidence of pyrheliometric records, such readings being functions of, among other things, both the solar atmosphere and the terrestrial atmosphere. He thus introduces a curve showing smoothed values of the annual average pyrheliometric values, and compares this with sun-spot frequency values (representing solar atmospheric changes) and number of volcanic eruptions (representing terrestrial atmospheric changes). The similarity of the last-mentioned with the pyrheliometric curve leads him to write as follows: "Hence it appears that the dust in our own atmosphere, and not the condition of the sun, is the controlling factor in determining the magnitudes and times of occurrence of great and abrupt changes of insolation intensity at the surface of the earth."

The action of the dust intercepting at times as much as one-fifth of the direct solar radiation leads him to inspect earth surface temperature values to inquire whether they are below normal on such occasions. The pyrheliometric and temperature curves suggest a relationship, but, as he states, "the agreement is so far from perfect as to force the conclusion that the pyrheliograph values constitute only one factor in the determination of world temperatures." A better agreement is secured when the combined effect of insolation intensity and sun-spot influence is considered.

The author then discusses the temperature variations since 1750 as influenced by sun-spots and volcanic eruptions, and indicates that the disagreement in the curves of temperatures and sun-spots is in every important instance simultaneous with violent volcanic eruptions.

Limitations of space will not permit us to remark on his references to the action of carbon dioxide in slightly decreasing the temperature or to probable great changes in level. Enough perhaps has been said to show that Prof. Humphreys, in his interesting attempt to show "that volcanic dust must have been a factor, possibly a very important one, in the production of many, perhaps all, past climatic changes . . .", has restarted a topic which will no doubt call for criticisms and discussions from many quarters.

BIOLOGY OF THE LAKE OF TIBERIAS.[1]

THAT natural history had its students among the ancient inhabitants of Palestine is clear from the book of the Levitical law and from the biography of King Solomon. But during the first century of our era there is nothing to show that the study excited the slightest interest in that locality. Fishes are mentioned for their economic use; mint, anise, and cummin as objects of taxation; the stars in the sky and the flowers of the field for their superficial beauty; crops are supposed to spring from dead seeds; pearls of impossible size are made the symbols of celestial splendour. It is only in modern times, and even now by strangers rather than natives, that a striking contrast to this apathy has been brought about. If the water of the Jordan is still carried westward for religious rites, samples from the Sea of Galilee are now collected with equal care for chemical analysis; Syrian Entomostraca are reared in England from mud out of the pool of Gihon at Jerusalem; from the Galilean lake, by the use of tow-nets, hand-nets, and special dredges, a varied fauna is obtained, such as might have excited the interested surprise of Solomon, but would probably have been viewed with disgust by the Sanhedrim of a later epoch.

Prof. Théodore Barrois, in his own interesting study of the Syrian lakes (1894), explains that the scientific exploration of them was begun in August, 1847, by Lieutenant Molyneux, R.N. By great efforts this officer succeeded in obtaining valuable hydrographical details, both in the lake of Tiberias and in the Dead Sea, only to succumb almost immediately afterwards to the exhausting effects of the climate, torrid and unwholesome at that season in the valley of the Jordan. In some future Dictionary of National Biography his name ought surely to find a place. His initial enterprise has been followed by the labours of many eminent naturalists. Dr. Annandale's present contribution to the subject was instigated by his desire to trace the genera of sponges and some other invertebrates "characteristic of the fresh waters of India and tropical Africa northwards up the Jordan valley, should they prove to have a distribution in any way similar to that of the Jordan fishes, whose African affinities have long been known." He concludes that "There is no reason to think that the sponge-fauna of the Lake of Tiberias is closely related to that of any other lake, but its affinities lie rather with that of Eastern tropical Asia, and possibly with that of the Caspian Sea, than with any in Europe and Africa."

His investigation of the Galilean fresh-water sponges leads Dr. Annandale to divide the Spongillidæ into two subfamilies, the Spongillinæ, in which microscleres are present, and the Potamolepidinæ, in which microscleres apparently are not produced. Of the former subfamily the lake of Tiberias provides only one species, the widely distributed *Ephydatia fluviatilis*, var. *syriaca*, Topsent. Of the latter it furnishes four species, allotted to two new genera, *Cortispongilla barroisi* (Topsent), only known from this lake, and *Nudospongilla reversa*, *N. mappa*, and *N. aster*, all new. These are described and figured, together with other species introduced for the sake of comparison.

Useful keys are provided for distinguishing the Galilean sponges one from the other, and for recognising various genera of the Spongillidæ.

[1] A Report on the Biology of the Lake of Tiberias. Series I. Journal and Proceedings, Asiatic Society of Bengal (New Series), vol. ix., No. 1, 1913.

The subject is rather intricate, as may be judged from the history of the genera Uruguaya, Carter, 1881, and Potamolepis, Marshall, 1883. In describing the latter, Marshall, it appears, confessed that its separation from Uruguaya depended only on a geographical consideration, one group being found in Africa, the other in South America. Yet now they are assigned to separate subfamilies. Dr. Annandale, however, admits that the recognition of his sub-family Potamolepidinæ "depends to some extent on the fact that no gemmules have been found in any species that can be definitely assigned to the genus Potamolepis," and that if in the future "gemmules be found in an undoubted Potamolepis with specialised gemmule-spicules that can be called microscleres, the genus would have to be transferred to the Spongillinæ." It is evidently a case in dealing with which the student must be specialised as well as the spicules. It will not interest the water board at Cardiff, which is reported to have cleared its pipes of a blockading sponge-growth simplv by using a solution of common salt, without reference to systematic nomenclature.

As it is sometimes supposed that the influence of environment is all-sufficing for the origin of species and makes natural selection a needless hypothesis, it is worth while to quote Dr. Annandale's remark that "it is not unusual for two species that live together to adopt diametrically opposite means to attain the same end." This he illustrates by the case of *Cortispongilla barroisi*, notable for the possession of a well-defined and almost symmetrical central cavity, while *Nudospongilla aster*, which inhabits the same environment, is a peculiarly compact sponge without any trace of a central cavity. The explanation offered is, that "if the particularly well-developed exhalent system implied in the production of a central cavity opening by a large osculum is advantageous in getting rid of silt that has entered the sponge, a compact structure may be equally efficient in preventing the silt from entering at all."

In separate sections of the report several subjects besides sponges are discussed by Dr. Annandale and his collaborators, but to these justice cannot be done within the limits of this notice.

T. R. R. STEBBING.

PROF. P. V. BEVAN.

THE younger generation of Cambridge physicists and many others will have noticed with regret the announcement in last week's NATURE of the death of Prof. P. V. Bevan at the early age of thirty-eight. He had a distinguished scientific record, and his friends confidently expected for him a useful and fruitful career. Entering Cambridge University in 1896 he took up the study of mathematics, and in 1899 was fourth Wrangler. The following year he was placed in the first division of the first class in part ii. of the mathematical tripos. With this equipment he turned his attention to experimental physics, and commenced research in the Cavendish Laboratory under Sir J. J. Thomson. In 1901 he was appointed to a demonstratorship, to which lecturing duties were added in 1904, and in 1908 he became Professor of Physics at the Royal Holloway College, a post which he held till his death.

Prof. Bevan's earliest important research was a very complete investigation of the action of light on the rate of combination of hydrogen and chlorine, but after his removal to London he devoted himself to optics. Starting from the work of Prof. R. W. Wood on anomalous dispersion in sodium vapour, he extended it to the vapours of other alkali metals. He made a detailed study of the absorption spectra of the vapours of lithium and cæsium, mapping their principal lines, and testing the applicability of the various formulæ suggested by Kayser and Runge, Rydberg, and Hicks to the series of lines in these spectra. Both at Cambridge and in London Bevan was keenly interested in the religious life of the students. He was president of the Cambridge Nonconformist Union, and later took an active part in the student Christian movement, to the publications of which he was a contributor. His was a strong, vigorous, and genial personality, which won the affection of all the students with whom he came into personal contact.

A. W.

NOTES.

FOR several days Sir David Gill has been suffering from double pneumonia at his residence in Kensington. As we go to press we learn that though his lungs are improving and he maintains his strength, his condition is still critical.

DR. TEMPEST ANDERSON, whose death was announced in NATURE of September 4, has left 50,000*l*. to the Yorkshire Philosophical Society, of which he was formerly president, and 20,000*l*. to the Percy Sladen Memorial Fund, established by his sister, Mrs. Sladen, in 1904.

IT is proposed to present to the Royal Society a portrait of the retiring president, Sir Archibald Geikie. A small executive committee, with Sir William Ramsay as chairman, has been formed to carry out the preliminary arrangements and collect subscriptions, which it is agreed should range between one and three guineas. Promises amounting to about one hundred guineas have been received already from fifty fellows of the society. Subscriptions may be sent to the treasurers of the Geikie Portrait Fund, at the Royal Society, or paid direct to Messrs. Coutts and Co., 440 Strand, W.C., for the fund. The subscribers will constitute a general committee, and they will be called together at a later date to consider the choice of an artist and other matters.

THE valuable services rendered to public departments by the Royal Society were referred to by Sir Archibald Geikie in his recent presidential address (see NATURE, December 4, p. 405); but it was pointed out that though the society has acquired the character of a kind of central bureau of science, there has been no corresponding increase of financial support. Sir Joseph Larmor, in *The Times* of December 20, refers