

wards in a Tapir-like manner, below the base of which the upper canines descend in a way which shows that it would be impossible to use them for defence or obtaining food, without doing great injury to the sensitive trunk which overshadows them. Nothing seems more illogical than the assumption, that because an animal has elephantine proportions and feet, it should possess a proboscis, especially when all arguments from the skull tend in a different direction.

THE Quarterly Weather Report, from July to September, contains, in addition to the usual tabular results, a discussion of four years anemometrical results for Bermuda.

WE have received the Report on the Freshwater Fish and Fisheries of India and Burmah, by Surgeon-Major Francis Day, Inspector-General of Fisheries in India.

WE have received from Prof. Edward Morse an excellent paper, read by him before the Boston Society of Natural History, on the Systematic Position of the Brachiopoda, in which, from a careful study of the anatomy and development of those animals, he has been led to endorse and substantiate Steenstrup's opinion as to their affinities being with the Annelids instead of with the Mollusca, as generally believed. The following is his concise summary:—"Ancient Chaetopod worms culminated in two parallel lines—on the one hand in the Brachiopoda, and on the other in the fixed and highly cephalized Chaetopods. The divergence of the Brachiopoda, having been attained in more ancient times, a few degraded features are yet retained, whose relationships we find in the lower Vermes; while from their later divergence the fixed and cephalized Annelids are more closely allied to present free Chaetopods." The author lays stress on the certainly soft and uncalcified condition of the earliest forms of life causing great imperfection in the earliest geological record.

IN the death of Mr. William S. Sullivant, which is recorded in the scientific columns of *Harper's Weekly*, and which took place at Columbus, Ohio, on April 30 last, the United States has lost one of its most accomplished botanists, especially in the department of the mosses, in which he was the recognised head for many years. From a biographical notice published by Professor Gray in the *American Journal of Science*, we learn that Mr. Sullivant was born in 1803, near Columbus, in the vicinity of which place he resided the greater part of his life. His first publication appeared under the title of *Musci Alleghanienses*, a work on the mosses and liverworts of the Alleghany Mountains, illustrated by prepared specimens of the plants themselves. This was shortly after 1843, and a few years later a work on the same subject was published in successive numbers as a memoir of the American Academy. The section of Mosses and Hepaticæ in Prof. Gray's *Botany of the Northern United States* was prepared by Mr. Sullivant, and credited to his pen. A separate edition was subsequently published by the author. A work on the mosses of Cuba was prepared by him, illustrated by specimens collected by Mr. Charles Wright. He also published, in 1859, the account of the mosses collected by the Wilkes expedition. The most important of Mr. Sullivant's publications, however, consists of his *Icones Muscorum*, being "figures and descriptions of most of those mosses peculiar to Eastern North America which have not been heretofore figured"—this forming an imperial octavo volume with 129 copper-plates. It is stated by Prof. Gray that a second or supplementary volume of *Icones* was in preparation by Mr. Sullivant, and nearly completed at the time of his death.

THE additions to the Zoological Society's Gardens during the past week include two Mouflons (*Ovis musimon*) from Sardinia, presented by Mr. H. E. Holloway; two Barbel (*Barbus vulgaris*) and a Bream (*Abramis brama*) from British seas, pre-

sented by Mr. E. S. Wilson; two Sacred Ibises (*Geronticus athiopicus*) from Gough's Island; a Black-handed Spider Monkey (*Atles melanochir*) from Central America, purchased; five Horned Lizards (*Phrynosoma cornutum*) from California, deposited.

SPÖRER'S OBSERVATIONS ON THE SUN*

THE author gives chiefly the results of his spectrum observations, and simultaneous spot observations, recorded in the Transactions of the Berlin Academy of Sciences for November 1871, and May 1872. To the two earlier instances of striking changes observed in the protuberances, there is added an interesting observation of August 8, 1872. It was estimated that the prolongation of the upper part of the protuberance had a velocity of forty-two kilometres per second, parallel to the sun's surface. In the case of many protuberances, it will be readily allowed that they are not only subject to cyclones, but also owe their origin to them. Protuberances of similar form, observed on several successive days, in the same heliographic latitude, Spörer has accounted for, by the supposition of volcanic eruptions, owing to the smaller rate of linear rotation of the deeper strata; if, however, we regard these protuberances as the results of cyclones, the explanation of the changes of position would rest upon the impelling power of the storms, and their tendency to create new forms; and the velocity of the advancing cyclone would, in several instances, average 1·4 kilometre.

Spörer, in this work, adheres to his division of protuberances into two classes. Secchi, in his work on the Sun, has distinguished four classes of protuberances, but afterwards accepted Spörer's twofold division. Both observers are at one in this, that the protuberances, which Spörer has named "flame" and Secchi "ray" protuberances, give different spectral lines, and stand in intimate connection with the spots. But with regard to the proper hydrogen protuberances, Secchi says they are not in the condition to give rise to a spot, against which Spörer adduces examples of their influence in neighbouring spot formation, especially prominent in the intervals between considerable protuberances of hydrogen.

The observation of the protuberance, which Secchi also noticed, on July 7, 1872, and which gave a well-marked image with the line 6543, is particularly described, and drawings are appended.

With regard to observations of spots, interesting comparisons are given, showing the difference between the two hemispheres in respect to the frequency of spots, and the mean heliographic latitudes. In this connection, Carrington's observations, from November 1853 to the beginning of 1861, are gone into, so that the comparisons embrace a period extending from November 1853 to the end of 1871. With regard to frequency of spots, it appears that the southern hemisphere exceeds the northern both in maximum and minimum. The curves also show distinctly the rapid passage from minimum to maximum, and the slow decrease after the maximum.

The mean heliographic latitudes are obtained through assigning to each group of spots, a factor of value (*Werthfactor*). The union of five-rotation periods gave a point of the curve for the northern as well as for the southern hemispheres. Carrington had obtained from his observations the striking result, that the spots at the time of the minimum approach the equator, thereafter veered off to higher latitudes, and that then the more numerous spotted zones gradually approached the equator. Spörer, by his observations since 1861, has confirmed this result.

* Translated from a review in *Der Naturforscher*, No. 29, of Beobachtungen der Sonne, von Prof. Dr. Spörer, Abhandlung zum Programm des Gymnasiums. Separat-Abdruck. Anklam. Verlag und Druck von Richard Poettcke: 1873.