

The services of photography to art were next touched upon by Sir H. T. Wood, who afterwards went on to say:

"The interesting investigations of Buchner and Marshall Ward into the action of light on bacteria can hardly with justice be admitted as adding to the list of photographic materials, though we must certainly claim the 'photobacteriograph' as an advance in our science and as suggesting new directions for photographic work.

"The question of sensitometry has exercised the minds of many of our most active workers for some time, but I think I may say without as yet any positive result. I believe I may put it as the opinion of those best qualified to express an impartial judgment on the subject, that while we have certainly obtained a means of roughly gauging the comparative sensitiveness of plates, and have got a guide of great practical use to the makers and users of plates, we are as far as ever from an absolute standard, and that the attainment of such a standard must await the attainment of a standard of light, a problem the solution of which is of importance not to photographers alone.

"It would obviously be unreasonable to expect that the increase of photographic knowledge should grow *pari passu* with the number of those who practise the art, but I think it is certainly a matter for regret that of the many thousands who have taken up photography as a pastime, so very few pursue it in a serious way, or in a scientific spirit. The popularisation of photography has indeed to my mind been a drawback to real progress. The process of picture-making has been rendered so easy that it has been deprived of much of its interest, even to the merest amateur in science, and the attention of those who might have pursued photography seriously has been diverted to other branches of science. Still we are fortunate in having, even among the younger workers, a considerable band of capable and active students who are adding slowly but surely to our knowledge of the scientific principles of the art.

"In photographic optics there is, I think I may say, a very distinct advance now going on. The expectations of opticians have long been fixed on the productions of the Jena manufactory, and those expectations are, according to the best information at my disposal, now in a fair way of being realised. The qualities of glass that are to be obtained commercially from Jena have provided the opticians with new possibilities for the improvement of photographic lenses. Both in this country and in Germany opticians are availing themselves of these possibilities. Great credit is certainly due to Messrs. Ross, who have carried out the work of Dr. Schroeder, and have produced from his calculations the lens which they have termed the 'concentric' lens. The double anastigmat of Goerz, described last year to the Society by that gentleman, is another new lens, the outcome of the Jena improvements in glass, which ought at least to receive mention.

"Mr. Dallmeyer has also made considerable advances, both theoretical and practical, in his 'telephotographic' lens, an instrument which produces results appealing at once to all who take any interest in photographic matters, and one which, in the opinion of competent authorities, is likely to have important practical applications for astronomical and other branches of scientific photography."

WILLIAM TOPLEY, F.R.S.

A GREAT gap has been made in the ranks of active geologists by the death of William Topley, which took place on the night of Sunday, September 30, at his house at Croydon. He was taken ill, with gastritis, probably from the use of contaminated water, in Algiers, during a short visit, made in reference to its geology; and he fell, therefore, in the fighting line of those

who apply their scientific knowledge for the good of mankind.

He was ill whilst travelling home, and though after a time he began a slow recovery, a relapse came on Saturday, September 29, which soon proved fatal.

Born at Greenwich in 1841, he had reached an age when, though the physical powers may have begun to wane, yet the mental powers are reinforced by stores of knowledge and of experience, and the value of a scientific life is high.

His scientific education was at the Royal School of Mines, Jermyn Street. Soon after his student-life was ended, he joined the Geological Survey (early in 1862), and his future career was identified with that Survey, of which he was one of the oldest and best-known officers at the date of his untimely death.

For many years his work lay in the counties of Kent, Surrey, and Sussex, in the investigation of the great district of the Weald and its surroundings, with which his name will ever be linked.

He made his mark as a good observer of facts and an able reasoner from them in 1865, by the paper, read to the Geological Society, "On the Superficial Deposits of the Valley of the Medway, with Remarks on the Denudation of the Weald," which was written jointly with his then colleague, Dr. C. LeNeve Foster. This is a most important essay, in which the general question of inland erosion is discussed, and the special question of the processes of denudation that had acted over a definite tract, on which much had been written, may be said to have been practically settled, an achievement of no small merit.

In 1866 Mr. Topley supplemented his knowledge of our Wealden deposits by a visit to the Boulonnais, a tract that really contains the severed eastern end of the Weald, a visit in which the writer had the pleasure of accompanying him, and the results of which were given to the Geological Society in 1868.

He soon turned his attention to the bearings of geology on other branches of knowledge, and in 1871 the Royal Agricultural Society published a paper by him, "On the Comparative Agriculture of England and Wales," followed, in the next year, by another, "On the Agricultural Geology of the Weald."

In 1873 a paper was printed by the Anthropological Institute, in which he treated of the relation of parish boundaries to great physical features. This was illustrated chiefly from parts of the Weald and its borders; but references were made to other parts, and amongst them to Northumberland, to which county he had been transferred from the south.

In 1874 he gave the Geological Society a very suggestive paper "On the Correspondence between some Areas of Apparent Upheaval and the Thickening of Subjacent Beds," in which he pointed out that an apparent dip (over a large tract) may be partly owing to the thinning of beds underground.

In 1875 appeared the work by which he will probably be best known, and in the writing and compiling of which he may be said to have raised his own monument. The Geological Survey Memoir on the Weald is noted, not so much for local details (of which, however, there are many) as for the thorough way in which the literature of the subject is treated, for the full discussion of the subjects of physical geology, scenery, and denudation, and for the attention given to many branches of applied geology. The parts mentioned indeed take up more than half of the text, adding greatly to the interest of the book.

Naturally the important work of the Sub-wealden Boring was not done without Mr. Topley's help.

In 1876, he used his northern experience in the field in joining his friend Prof. Lebour in a paper to the Geological Society, on the intrusive nature of the Whin Sill, published the following year.

Since that time he contributed papers to various societies, other than those already mentioned, and to various journals. These are chiefly on questions relating to economic geology, such as water-supply, petroleum, and coal in south-eastern England; and are too many to be noticed here. His name also appears, of course, as author, or part author, on many sheets of the maps and sections of the Geological Survey.

It is not only, however, by his published works that Mr. Topley is known—in science his was a public life. He took a marked part in the work of the British Association, and was secretary of its Geological Section for no less than fifteen years—one of the longest of such secretarial lives. He also served on some committees, and was secretary of that on coast erosion, the reports of which owe much to him. He served on the councils of the Geological Society and of the Geologists' Association for many years, and was president of the latter body for two years (1885-7). He took part in most of the international geological congresses, and worked hard for the great one in London, of which he was a secretary, in 1888. He was also for some time a sub-editor, and afterwards editor, of the *Geological Record*.

In his latter years, his presence at the Geological Survey Office, for a period of about fourteen years, brought him into contact with many people, who benefited by his knowledge and by his readiness in imparting it. Amongst engineers and others he was widely known as an expert of the most trustworthy kind on questions of water-supply, and of other subjects in which geologic knowledge comes in.

Happy in his domestic relations, of a kindly, cheerful disposition, good-natured and hospitable, he was always ready to help his brethren of the hammer, as well as all those who went to the Survey Office for information; indeed, a former colleague has said of him, to the writer, that his one prominent fault was excessive amiability.

He will be greatly missed by his colleagues, and his loss will be felt over a much wider circle—in fact, by all who knew him.

W. W.

NOTES.

Two letters of Charles Darwin are published for the first time in the *Bulletin* of the Royal Botanic Gardens, Trinidad, No. 22, April 1894. These letters were addressed, before the completion of Darwin's book on the fertilisation of orchids, to the late Dr. Herman Cruger, who was Government Botanist at Trinidad for some years, asking him to observe if possible the fertilisation of certain species of the Melastomads. In the first letter he expresses a suspicion that the flowers which have the singular projections, or horns from their anthers, may be visited by small insects which penetrate one of the horns of the anther with their proboscis, to obtain the fluid contained in them. In the second letter he admits that this suspicion is quite groundless, and asks for information with regard to any instances of "bud-variation" in plants from the warmer regions cultivated in the West Indies.

THE Botanical Society of America is about to try the experiment of admitting working naturalists only to its full fellowship. By a unanimous vote the Society has adopted a new constitution providing that none but American botanists engaged in research, who have published work of recognised merit, shall be eligible to active membership. Candidates for active membership must be recommended by three active members of the Society, but any nominee may be objected to by any member, and if ten members object, the name will not be considered by the Council. Nominees may be rejected by two negative votes in the Council, which numbers seven members, or by one-fifth of the votes cast after the name has been approved. The President of the Society for the present

NO. 1302, VOL. 50]

year is Prof. W. Trelease; the Vice-president, Prof. N. L. Britton; the Secretary, Mr. C. R. Barnes; the Treasurer, Mr. J. Donnell Smith.

DR. T. LAUDER BRUNTON, F.R.S., will deliver the annual Harveian oration at the Royal College of Physicians, on Thursday, October 18, at 4 p.m.

Two new wings of the Durham College of Science were inaugurated on Tuesday. The wings include apartments to be devoted to the study of engineering and the fine arts.

ON Friday last, the Duke and Duchess of York opened the new medical school, erected at a cost of £40,000, in connection with the Yorkshire College, Leeds, and also a new central hall and library, which have been added to the College at a cost of £20,000.

THE Essex Field Club will hold its annual cryptogamic and botanical meeting on Saturday, October 13. The headquarters for the meeting is the "King's Oak" Hotel, High Beach, Epping Forest.

THE opening meeting of the Royal Microscopical Society will take place on Wednesday, October 17, at 8 p.m., when Mr. F. Chapman will read a paper "On the Foraminifera of the Gault of Folkestone"; and Dr. H. Stollerfoth will give some notes on the genus *Corethron*.

A MEETING of the Institution of Mechanical Engineers will be held on Wednesday evening, October 24, and Thursday evening, October 25. The following papers will be read and discussed, as far as time permits:—"The Manufacture of Standard Screws for Machine-made Watches," by Mr. Charles J. Hewitt (Wednesday); "Drilling Machines for Cylindrical Boiler Shells," by Mr. Samuel Dixon (Thursday).

It is reported that a violent storm passed over the town of Little Rock, Arkansas, at the beginning of last week. Though the storm or tornado only lasted three minutes, eight persons were killed during that time, and several were seriously injured, while property was damaged to an amount estimated at £200,000. The direction of motion of the disturbance was from south-west to north-east, and the width of the path traversed was only about two hundred yards. The storm was accompanied by heavy rain, and was followed by brilliant lightning.

ONE of the most valuable and extensive botanical libraries in the country, that collected by Prof. Lindley, has been for many years deposited in the rooms of the Royal Horticultural Society, under the care of trustees. It is now proposed to increase the value of the Lindley Library by forming, in connection with it, a library fund, to be administered by the trustees in connection with the Council of the Royal Horticultural Society. The money would be expended in cataloguing the library, and in the purchase of new books, for which the income at present at the command of the trustees does not suffice. Donations of horticultural and botanical works are also desired.

THE Berlin correspondent of the *Times* reports:—"The death is announced of Prof. Pringsheim, the well-known German botanist, at the age of seventy-one. As early as his thirty-third year he was elected member of the Berlin Academy of Sciences in appreciation of his researches and writings, which dealt especially with the processes of fructification and germination in the family of the Algae. From 1864 to 1868 he filled the post of Professor of Botany at Jena, where he founded the first Institute for Vegetable Physiology, and this example was soon followed in other parts of Germany. Prof. Pringsheim returned to Berlin in 1868 and established a private laboratory, in which he carried out valuable investigations on the sexual life of the lowest vegetable organisms."