shall be vertical in all positions, has been so perfected by the Repsolds, that it leaves nothing to be desired.

12. The Washington plan of having the whole micrometer-plate, including both fixed and movable wires, moved by a fine screw, offers such a convenience in setting, that it should always be adopted.

13. The old system of having a single finder on that side of the telescope which is opposite the declination-axis becomes very inconvenient in a large instrument, owing to the necessity of setting the slit in the dome, not only to the telescope, but to the finder. The plan adopted in the Vienna telescope, of having two finders, — of which one shall be above, and the other below, the telescope when the latter is in the meridian, — obviates this difficulty, and should always be adopted.

THE AMERICAN AWARDS OF THE GEOLOGICAL SOCIETY OF LONDON.

WE give below the text of the addresses on the occasion of the awards to Dr. Leidy and Mr. Lesquereux at the annual meeting of the Geological society of London in the middle of last month.

The president handed the Lyell medal to Prof. W. H. Flower, F.R.S., for transmission to Dr. Joseph Leidy, F.M.G.S., and addressed him as follows: —

PROFESSOR FLOWER, — The council has bestowed on Dr. J. Leidy the Lyell medal, with a sum of twenty-five pounds, in recognition of his valuable contributions to paleontology, especially as regards his investigations on the fossil Mammalia of Nebraska, and the Sauria of the United States of America. These vast, and, in comparison with our own country, but little explored, territories have for some years past yielded a harvest of fossil vertebrate remains of exceeding richness, of which we have no example here. How well this harvest is being garnered by our trans-Atlantic *confrères* the flood of memoirs published by them during the last quarter of a century bears witness. Amongst these scientific laborers in the paleontological harvest-field, Dr. J. Leidy has held a foremost place. Careful in observing, accurate in recording, cautious in inferring, his work has the high merit which trustworthiness always imparts. The well-nigh astounding number of papers written by him between 1845 and 1873 (amounting to a hundred and eighty-seven), his reports on the 'Extinct vertebrate fauna of the western territories,' his 'Synopsis of the extinct Mammalia of North America,' and his 'Cretaceous reptiles of the United States,' testify to the fertility of his pen.

Professor Flower, in reply, said: — Mr. President, as I have profited so deeply by Dr. Leidy's paleontological writings, and also have the pleasure of his personal friendship, I was much gratified by his request, communicated to me by telegraph a few days ago, that I would represent him on this occasion, and receive from your hands the award which the council has so worthily bestowed. By the same means of communication, he mentions the interesting incident, that it was by Sir Charles Lyell's advice, given to him in Philadelphia about thirty years ago, that he was induced to abandon the study of medicine and take up paleontology. A letter which I understand Dr. Leidy has written, in which he doubtless has expressed his own thanks to you, has not yet reached me; but I am quite sure that this recognition of his valuable labors in that marvellously fruitful field of discovery, the extinct vertebrate fauna of North America, will be greatly appreciated by him and by his fellow-countrymen, by whom he is so justly esteemed.

The following is the letter from Dr. Leidy, mentioned by Professor Flower: —

PHILADELPHIA, PENN., 1302 FILBERT STREET,
Feb. 7, 1884.

MY DEAR SIR, — I have just this minute received your note of Jan. 25, and hasten to reply, that there may be no delay in my answer, for the anniversary meeting of Feb. 15. I was equally surprised and delighted at the action of the council of the Geological society in awarding to me the Lyell medal and its accompaniment. Such approbation of my services I regard as rich compensation, added to the pleasure derived from my labors. I must add that I feel as if Sir Charles Lyell himself was expressing satisfaction, in consideration of my having complied with his wish, when thirty years ago, in my own home here, he said he hoped I would devote my time to paleontology instead of medicine.

Please present to the Geological society my warmest thanks for the honor it has conferred upon me. I have written to Prof. W. H. Flower, asking him to receive the award on my account.

With sincere regard,

JOSEPH LEIDY.

MR. WARINGTON W. SMYTH,
For. sec. Geol. soc.

In handing to Professor Seeley, F.R.S., a second portion of the proceeds of the Barlow-Jameson fund for transmission to Professor Leo Lesquereux, F.C.G.S., the president spoke as follows: —

PROFESSOR SEELEY, — The council has awarded to Professor Leo Lesquereux the sum of twenty pounds from the proceeds of the Barlow-Jameson fund, in recognition of the value of his researches into the paleobotany of North America, and to aid him in further investigations of a similar kind. Professor Lesquereux's 'Contributions to the fossil cretaceous and tertiary flora of the western territories,' published in the 'Reports of the U. S. geological survey,' are works which, for their matter, typography, and illustrations, leave nothing to desire. In transmitting this award to Professor Lesquereux, you will convey to him the hopes of the council that it may assist him in prosecuting further investigations in the difficult branch of research in which he has already accomplished so much.

Professor Seeley, in reply, said: — Mr. President, I

feel much honored in receiving this award on behalf of Professor Lesquereux. His valuable researches not only contribute systematic descriptions of the American secondary and tertiary floras, but furnish almost the only data for comparing those floras with the plant-life from similar strata on this side of the Atlantic. All Professor Lesquereux's work is marked by such exactness and care, that I am glad we are thus able to honor it, and offer assistance in its progress.

THE DIFFICULTY OF PREVENTING THE OHIO FLOODS.

WILLIAM E. MERRILL, lieutenant-colonel U. S. engineers, in charge of the government improvements in the Ohio River, has, at the request of the editor of the *Cincinnati commercial gazette*, made public his views respecting the causes of the Ohio floods, and discussed the possibility of their mitigation in a letter published in the issue of March 8 of that journal.

In attempting to estimate the influence of forests, he says, experience has proved that the clearing and cultivation of level land have comparatively small effect upon floods, and may be left out of account: disastrous effects follow only when the hill and mountain sides are put under cultivation. The evil results of denuding the hills of trees are then illustrated by references to Spain, Palestine, Greece, parts of Italy and France, and the good results of reforesting the slopes of the French Alps noted.

Above Cincinnati the watershed drained by the Ohio comprises the western third of Pennsylvania, the whole state of West Virginia excepting four counties, the eastern part of Kentucky, and nearly the entire state of Ohio. Now, leaving out of consideration the more level portions of this area, the question is, whether its hilly and mountainous parts have been cleared of forests to such an extent as to materially affect its capacity to retain the rainfall, and so to call for legislative action to prevent greater calamities in the future. Col. Merrill answers this question emphatically in the negative. Speaking from an extended personal knowledge of the states of Pennsylvania, West Virginia, and Kentucky, which comprise the hilly portion of the Ohio basin, he says we are very far from having attained that state of forest destruction which would require the intervention of the government for the protection of the river-valleys in this manner. Any one who travels on the railroads which cross the Alleghanies sees that the country is still heavily wooded, while away from the lines of the railroad it is still a wilderness, except in a few isolated valleys. Even the removal of the merchantable timber from the country would do no especial damage, provided the underbrush and smaller trees were left to protect the soil. We thus far have no sure ground, he remarks, for asserting that man's interference has had any marked influence upon the discharge of the Ohio.

In sharp contrast with these views of Col. Merrill is an article on forests and floods in the *New York independent* for March 6 (p. 30), by Mr. N. H. Egleston of Washington, D.C., in which the basis of argument seems to be furnished by the map prepared by Professor Sargent to illustrate the census returns in regard to the condition of the forests, and more particularly by a careful examination of the amount of woodland now existing in the state of Ohio as compared with that of twenty years ago.

As the state is not much of it hilly, the argument appears in so far to be inconclusive, although the author states and explains the popularly accepted theory of the controlling influence of forests with great skill, and without hesitation ascribes the Ohio floods to their destruction. But Col. Merrill very pertinently remarks that the traditions of the aborigines show that even the great flood of 1884 was equalled by floods which occurred before white man's axe felled a single tree in the valley of the Ohio.

Whatever may be thought of the relative value of opinion upon this question, there is no doubt that Col. Merrill speaks as an expert and an authority when he treats the problem of controlling the surplus waters of the Ohio by artificial means. He says, the idea that it is possible to build a number of reservoirs in the mountains to store up water during freshets, and let it out during the scarcity of summer, is an old one, and one which has been discussed and abandoned in case of various European rivers. It was, moreover, advocated by the able engineer, Charles Ellet, jun., and vigorously pressed upon the attention of Congress. When the improvement of the Ohio was taken in hand by the government, after the close of the civil war, this scheme was practically investigated by W. Milnor Roberts, whose long engineering experience in railroad and canal construction in western Pennsylvania, and consequent familiarity with its topography, peculiarly fitted him for this work. After an exhaustive examination of possible sites, and estimate of cost of retaining reservoirs, which will be found in detail in his report to the chief of engineers under the date of April 30, 1870, he concludes thus: "My own careful investigations of the subject of controlling the floods of the Ohio by means of artificial reservoirs, which were made in 1857, satisfied my mind conclusively that such control by human means, attainable within practicable limits of cost, is impossible."

Mr. Roberts then examined another question, which was the practicability, not of controlling the floods at all, but of simply storing sufficient water to provide a supply to supplement the scarcity of the summer to such an extent that the summer flow at Wheeling should not fall below six feet. The reservoirs required to accomplish this were estimated to have a capacity of not less then a hundred and fifty billion cubic feet, and they must store the drainage from a watershed of not less than thirty-six hundred square miles. The estimated cost of accomplishing this with thirty reservoirs was sixty million dollars, a sum out of all proportion to the advantage to be derived from the improvement. Moreover, the dangers attendant upon such reservoirs are too great to justify the construction of even the few reservoirs required to secure a navigable stage of water, to say nothing