

fifteen years before a timber famine must occur, which will greatly enhance the value of European forests.

Brandis explains the present lamentable state of affairs in the United States, as follows:—The Timber Culture Act, which was in force in certain of the States, provided that settlers should plant up with trees one quarter of the area allotted to them, and it was thus hoped to obtain forests in the treeless regions between the Rocky Mountains and the Mississippi river. Large tracts of land have been occupied under this Act, but very little progress has been made in afforestation. It is not difficult in the Republic for people to neglect engagements they have made with the State. It has been recognized for some time past that this law has been practically of little use, and it was therefore abrogated in March, 1891. The law abrogating it, in section 24, empowered the President to demarcate and reserve certain tracts of State forest. Great hopes were therefore entertained, and soon afterwards a proclamation was issued largely extending the Yellowstone Park, in Montana, on the borders of Canada.

This measure had been strongly supported for some time past by the American Forestry Association. The Park is a mountain forest tract on the water-parting between the Rivers Columbia and Missouri, and its preservation and proper management is of immense importance. In October, 1891, the extensive forest tract in Colorado in the Rocky Mountains, in which several large tributaries of the Colorado river have their rise, and containing 1,365,000 acres, was proclaimed as the White River Forest Reserve. It was also expected that a portion of the western slopes of the Sierra Nevada, bordering on the Yosemite National Park, and other localities where the *Sequoia gigantea* flourishes, would be proclaimed as State reserves. These two national parks were previously reserved under older laws. The numerous intelligent friends of forestry in America confidently expected that a beginning would now be made in the demarcation of extensive State forest reserves, and in their scientific management.

The most recent news from America, however, has thoroughly upset these expectations. A Bill has been introduced into Congress, to hand over most of the Yellowstone forest reserve to a railway company. It is considered certain that this Bill will pass the Lower House, and it is not expected that the Senate will refuse to sanction it. Wood merchants, mining speculators, and sheep owners are vigorously agitating against the proposed reserve in the Sierra Nevada, and it is feared that their agitation will carry the day.

The American Forestry Association, which held its tenth annual meeting last January, has "memorialized" the President that instead of making a few reserves here and there, he should proclaim the reservation of all State forests still left to the Union, and arrange for their proper management. Friends of the forest are numerous in America, and insight into the essential necessity of forest protection is spreading, owing to the numbers of Americans who travel in Europe, but in a land where the dollar rules, and where an individual who will not recognize its authority is considered a fool, any steady progress towards State forest management cannot be expected.

Bernhard Fernow, the chief of the Forestry Branch of the Ministry of Agriculture at Washington, still hopes for action in this direction on the part of Congress and the State Executive. At the last meeting of the Forestry Association, he rightly urged that æsthetic and sentimental grounds for improving American forests must be left entirely in the background. Only where important material interests are concerned, such as securing a continuous supply of wood, or a supply of water, or climatic considerations, should the State limit the freedom of its citizens in dealing with forests. If, however, for urgent reasons of public utility, it should be necessary to reserve

a forest, the State should not be contented with merely demarcating and protecting it, but should introduce scientific management, so that the neighbouring populations may be able to utilize the forest produce; and in any case, all pre-existing rights acquired by the people in the forests should be strictly protected. Fernow concludes with the strongly-expressed advice that a law should be passed reserving the relics of the forests of the Union, and preventing any fresh alienations. He firmly believes that such a law is most urgently required. It is, however, quite a different matter for Congress to pass any such law, though more may perhaps be expected from the separate States in the Union, and in those of New York and California some rather halting steps have been taken in the right direction.

As matters stand at present in the United States, it is pretty obvious that a time will come when landowners will look upon their private forests as a good investment, for prices of wood and other forest produce are steadily rising. Little progress has, however, yet been made in this direction, and recent attempts made by some rich men to manage their forests properly with advantage have failed.

Sir Dietrich Brandis then turns to the progress made in the study of American forest trees, and states that literature on the subject is pretty abundant, but is after all merely thrashing straw. What is wanted in America is a practical proof that in forests of the Weymouth pine, of Minnesota, or of Californian red wood, or of Douglas fir in Washington and Oregon, or in the splendid mixed broad-leaved forests of the Alleghany mountains, good forest management will prove more remunerative than wasteful pillage (*Raubbau*).

The remainder of Brandis's paper is chiefly of botanical interest, and greatly praises Sergent's magnificent work. One other passage is too interesting to be omitted. It refers to the mesquit tree, *Prosopis juliflora*, which belongs to the dry zone in the south-west of the United States, and is also found in Mexico, and in the Andes as far as Chili and Argentina. In the river valleys of Arizona, where, although the air is dry, yet subsoil water is near the surface of the ground, this species forms extensive forests. On drier soils the aerial parts of the tree are reduced, but the root system is greatly extended. Sergent states that while the stem may be only a few inches high, and may only bear a few leaves, yet the tap root goes straight down to the subsoil water, and the aerial growth of the tree furnishes a clear indication of the depth at which the latter may be found.

Wherever the mesquit is a tree the subsoil water is forty to fifty feet down, where it is a small shrub it is from fifty to sixty feet down, and wherever the roots descend over sixty feet, the plant is not more than two or three feet high. In the scantily-wooded districts, where the mesquit tree grows, its roots yield most of the firewood, and are dug up, or dragged by oxen from the ground. *Prosopis spicigera* in the drier parts of India similarly furnishes fuel and cattle fodder in the Punjab, Sindh, and parts of Berar. This tree, there termed the *Jhand*, sends down its roots to a depth of fifty feet and more, to the subsoil water, and thus produces wood in a dry country, providing the peasant with fuel and wood for his plough. W. R. FISHER.

JOHN STRONG NEWBERRY.

IT is not only in the United States that the death of this veteran of scientific research will bring widespread regret. To many geologists and palæontologists in this country and on the Continent he was personally known, and those whom he honoured with his friendship will feel keenly the loss they now sustain. He was born at New Windsor, Connecticut, on December 22, 1822,

and took the degree of M.D. from the Cleveland Medical College, Ohio, in 1848. Before beginning the practice of medicine, which he intended to be his occupation in life, he spent two years in Europe. During his stay at that time in Paris he acquired a good knowledge of the French language, and had many opportunities of cultivating a love of science, which soon manifested itself as one of his distinguishing characteristics. Returning to his native country, he began practice as a medical man at Cleveland in 1851. Even at the outset of his professional work he contrived to find time also for scientific enquiry. His first published paper appeared in the same year in which he started in his medical profession. It is devoted to the geographical distribution of land and fresh-water shells.

But he soon entered upon the two branches of geological investigation in which he was to make his name familiar all over the civilized world—the study of fossil botany and of fossil fishes. As early as the year 1853 he made his first contribution to the history of Carboniferous plants, and three years later his earliest memoir on fossil fishes was published. By this time his scientific acquirements and enthusiasm were widely known. Hence when an expedition under Lieutenant Ives was organized for the exploration of the Colorado River of the West, Newberry was selected to accompany it, and to take charge of the observations to be made in natural history. His geological contribution to the famous Report at once placed him in the very front rank of American geology. His account of the geological structure of the region traversed by the expedition, and of the marvellous denudation of the cañons, will always remain as one of the landmarks of geological progress.

He had now been touched by the fascination of exploration in the far west. The drudgery of medical practice became irksome to him, so that when in the year following his return from Colorado the offer was made to him to take part in another expedition, he gladly availed himself of the opportunity. He accordingly accompanied Captain Macomb in an exploring expedition in the summer of 1859, from Santa Fé, New Mexico, to the junction of the Grand and Green Rivers of the Grand Colorado. This journey forms the subject of another masterly report by him, which, however, was not published for some sixteen years.

The shadows of the coming great Civil War were already falling on the United States, when Newberry was at work on the preparation of the record of the results of his western journeys. The storm at last burst in 1861, the same year in which his Colorado report was issued. Among the many scientific men who placed their services at the disposal of the North, Newberry took a foremost place. His medical skill and wide general scientific knowledge enabled him to be of great use to the army. He specially distinguished himself in the organization and administration of the hospital department. Among the reminiscences of his not uneventful life he had many graphic tales to tell of his experiences during that momentous epoch in the history of the United States. After the close of the war in 1865 he returned with renewed ardour to his scientific labours, and specially devoted his energies to the study of the ancient floras and fish-faunas of North America. Among his numerous memoirs on these subjects the two large monographs forming vols. xiv. and xvi. of the series published by the United States Geological Survey are specially worthy of notice. But they represent only a part of the enormous mass of material which he had worked over.

Prof. Newberry early in his career saw how great was the aid which geology could afford in the development of the mineral industries of his native country, and he gave himself with great energy to the practical applications of the science. He became one of the highest authorities on mining matters in the country,

and he was mainly instrumental in the equipment of the great mining school of Columbia College, New York. He occupied the Chair of Geology in that establishment, and threw himself heart and soul into its duties. At last, in the midst of his work and honours, a stroke of paralysis disabled him from active duties, and he grew gradually feebler until his death. With him American science loses one of its most honoured and distinguished cultivators. His piercing eyes and well-cut features made him a marked figure in any assembly, while his courtesy and gentleness, and his unfailing helpfulness and serenity, gave him a charm which will endear his memory to a wide circle of friends. A. G.

NOTES.

ALL entomologists in the country will learn with great satisfaction that the Treasury has consented, on the recommendation of the Trustees of the British Museum, to make provision in the estimates for the coming financial year for the purchase of Mr. Pascoe's well-known collection of insects. The importance of the acquisition of this collection by the nation is very great, as it contains an immense number of types, especially of the families Longicornes and Curculionides, to which Mr. Pascoe devoted so much attention for a period of more than forty years. Its dispersal or removal to a foreign country would have been an irreparable loss to British entomologists.

THE medals and funds to be given at the anniversary meeting of the Geological Society of London on February 17 next have been awarded as follows: The Wollaston Medal to Prof. N. S. Maskelyne, F.R.S.; the Murchison Medal to the Rev. O. Fisher, the Lyell Medal to Mr. E. T. Newton; and the Bigsby Medal to Prof. W. J. Sollas, F.R.S.; the balance of the proceeds of the Wollaston fund to Mr. J. G. Goodchild; that of the Murchison fund to Mr. G. J. Williams; and that of the Lyell fund to Miss C. A. Raisin and Mr. A. Leeds.

BETWEEN June 10 and 18 the University of Montpellier will celebrate the third centenary of the foundation of its Botanic Garden, on which occasion it is intended to invite a general congress of the botanists of all nations.

A MEETING of the Association for the Improvement of Geometrical Teaching was held on January 14, at University College, Gower Street, the chair being taken by the Master of St. John's College, Cambridge. The reports of the Council and treasurer having been read and adopted, Dr. Wormell was elected President for 1893, the hon. secretaries (Mr. E. M. Langley, 16, Adelaide Square, Bedford, and Mr. C. Pendelbury, 4, Glazbury Road, W. Kensington), and the other members of the Council being re-elected. Dr. Wormell having taken the chair, Mrs. Bryant gave a model lesson on geometry to a class of about twenty ladies. After an adjournment papers were read by Mr. G. Heppel on the use of history in teaching mathematics, and by Mr. F. E. Marshall on the teaching of elementary arithmetic. The attendance was larger than usual, and interesting discussions followed the lesson and the papers.

A DEPARTMENTAL committee, consisting of officers of the Charity Commission, the Education Department, and the Department of Science and Art has been appointed by Mr. Acland, Vice-President of the Committee of Council on Education, to consider the question of the organization of secondary education in England and Wales, and the relation of the Departments among themselves in connection with this subject. The Committee consists of the following members:—The Vice-President of the Council (chairman), Sir H. Longley, K.C.B., Chief Charity Commissioner, Mr. T. E. Ellis, M.P., Parliamentary Charity Commissioner, and Mr. Fearon, Secretary to the