

Irrigation Papers, U. S. Geol. Surv., No. 32, 1899).

THE DUNES OF GASCONY.

THE great belt of dunes that borders the straight coast of Gascony is well described by R. Le Mang (*Deutsch geogr. Blätter*, Bremen, xxii, 1899, 235-256). The dunes frequently rise 40 meters (one reaches 89 m.) over a belt 6 or 8 kil. wide and 240 kil. long. Near the sea the ridges lie north and south, parallel to the shore; further inland they trend east and west, parallel to the prevailing winds. The inland dunes have long been forested and stationary; the shore dunes were until recently barren and wandering. Fields and forests were buried and villages were overwhelmed by the advancing sand; the mouths of streams were blocked and shifted; lagoons were pushed inland with rising water level, invading and drowning fields and villages. Now, after many years of experimental effort and nearly a century of systematic work, the advancing dunes have been arrested. A half artificial dune or dike runs along the beach, with very gentle slope to the sea; here the wear of winter storms must be repaired during the succeeding summer. Next follows a protection zone, 300 to 1500 met., wide, covered with stunted firs and bushes, where the first strength of the sea wind is expended. Then comes the great artificial forest of firs and oaks, under whose cover the invasion of the dunes has entirely ceased.

THE MORVAN.

AN area of crystalline rocks, forming an upland known as the Morvan, a northern branch of the central plateau of France, was visited in the spring of 1899 by a party under the direction of M. Vélain, professor of physical geography at the Sorbonne; and a report of the excursion is made by M. Martonne, instructor in geography in the university of Rennes (*Annales de Géogr.*, viii, 1899, 405-426, maps and photos.). The mesozoic strata that once covered the crystallines of this district more or less completely are now worn back so that the ancient crystalline floor is broadly revealed as a plateau, gently undulating where it has longer been exposed to erosion, remarkably even where recently uncovered; the harder members of the

overlapping strata have retreated in strong escarpments that rim around the crystalline area on the east, north and west, while the less resistant members are reduced to plains between the scarped reliefs. A recent general elevation is indicated by the narrow valleys, frequently having incised meanders, by which the uplands and lowlands are alike dissected. The origin of the drainage is not especially considered; it appears to be in greater part the accordant with the general dip of the strata away from the Morvan center, and hence would be classed as originally consequent.

THE FLÄMING.

BETWEEN the mountains of middle Germany—Harz, Erzgebirge, Riesengebirge—on the south, and the Baltic lowlands on the north runs a belt of low uplands, underlain by some inequality of rock-floor and built up as a 'diluvial plateau' by the moraine of an early glacial epoch; now cut into disconnected parts by the broad valleys of glacial rivers. The Fläming is one of these uplands, lying east of Magdeburg between the Elbe and the Spree. It is recently described by E. Schöne (*Beitr. zur Geogr. mittl. Deutschland*, herausg. von F. Ratzel. *Wiss. Veröffentlichungen Verein f. Erdkunde*, Leipzig, iv, 1899, 93-194). The softly rounded hills are separated by ramifying dry valleys or 'Rummeln' which lead streams in wet weather. Faint terraces on the sloping valley sides are ascribed to stream action during the erosion of the valleys, although in a photographic illustration they closely resemble pasture paths, and indeed their modification by sheep is noted in the text. The steeper valleys on the northern slope of the Fläming have supplied gravel for the construction of a number of flat alluvial fans on the floor of the bordering glacial-river trough.

W. M. DAVIS.

BOTANICAL NOTES.

FOSSIL PLANTS OF THE BLACK HILLS.

A RECENT paper in the nineteenth annual report of the United States Geological Survey, entitled 'The Cretaceous Formation of the Black Hills as indicated by the Fossil Plants,' by Lester F. Ward, is of more than usual in-

terest to the general botanist, since it is given over almost wholly to a discussion of the cretaceous flora of the region. Much space is given to the fossil cycads which have been found in abundance in several areas within the Black Hills. These are all referred to the genus *Cycadeoidea*, of Buckland, of which twenty-two species are described, twenty being new to science. The great majority of these were found in the Minnekahta region in the southern part of the Hills, the remainder occurring in the Blackhawk region on the eastern side. The fossil forests receive considerable attention also. These occur in the Minnekahta, Blackhawk, and Hay Creek regions, the latter on the northern side of the Black Hills. The systematic position of the trees here found as fossils, has not been determined, as the structure of the wood has been too much obscured in the process of silicification. One specimen of fossil wood turned out to be a new species of *Araucarioxylon*. Other fossil plants from the lower Cretaceous enumerated in this paper are, nineteen species of pteridophytes, twenty-six gymnosperms (in addition to those already mentioned), four dicotyledons, and six fruits of uncertain relationship. From the Dakota group there are, one pteridophyte and seven dicotyledons. One hundred and sixteen plates, several maps and a few wood cuts amply illustrate this interesting paper.

THE PHYSIOLOGICAL RÔLE OF MINERAL NUTRIENTS.

AN important paper (*Bulletin* 18) by Dr. Oscar Loew of the Division of Vegetable Physiology and Pathology is devoted to the discussion of the physiological rôle of the mineral nutrients of plants. After an introductory chapter the rôle of phosphoric acid, iron compounds, hydrogen compounds, alkali salts, and calcium and magnesium salts are taken up in succession. A full review will appear later, this note being intended merely to call the attention of biologists to a paper which must prove to be of great value to them.

THE FOREST RESERVES OF THE UNITED STATES.

HENRY GANNETT, geographer to the United States Geological Survey, publishes in the nine-

teenth annual report a collection of papers on the forests of the West, especially of the forest reserves created by executive order of President Cleveland about four years ago (Feb. 22, 1896). It is a thick royal octavo volume of 400 pages, illustrated with 110 plates, most of which are fine 'half tones' from photographs. A thick packet of maps, also, accompanies the volume. A study of the illustrations and maps, alone, tells the tale of wanton waste, which has been characteristic of our treatment of the forest covering of our country from the beginning. The lumberman who is only anxious to get out the best trees with the least expenditure of time and money, caring nothing for the future of the forest, and the careless 'camper' who leaves his fire for the winds to spread through the forest, together are devastating the western forests, as they have the eastern. No one can glance over this volume and not feel indignant over the heedlessness shown by the people who take possession of the forest lands of the Nation. Here and there nature is making an effort to reforest the denuded areas, showing us what we might do easily in the way of preserving these forest areas for our children. These reservations came none too soon, and yet we remember with what bitterness the President was assailed by greedy lumbermen, and a certain class of politicians always eager to curry local favor.

We may quote one paragraph from the paper by John B. Leiberger on the forest conditions of northern Idaho. "There can be no doubt as to what the future will bring. The complete destruction of the forest in this region as a commercial factor is beyond question, unless the forest is placed at once under effective supervision. At the present time less than 40 per cent. of the burnt areas are reforesting, and sections carrying the young growth are re-burned annually. Sixty per cent. are either in the brush stage or would be entirely barren but for small quantities of coarse grasses or weeds. These tracts will nearly all reforest in time, but to accomplish this result fires must be kept down. The forest conditions prevailing in northern Idaho merely foreshadow future forest conditions elsewhere in the wooded districts in the west."

A STUDY OF FUNGUS POISONS.

By the use of a number of deleterious agents, Mr. J. F. Clark was able to determine approximately their toxic effect upon the germination and development of certain fungi. His results were published in the November and December numbers of the *Botanical Gazette*. He used five common moulds, viz: *Aspergillus flavus*, *Sterigmatocystis nigro*, *Oedocephalum albidum*, *Penicillium glaucum* and *Botrytis vulgaris*, on account of their ability to grow normally under the conditions imposed by the experiments. Twenty-eight chemical substances were used, including half a dozen acids, eight hydroxids, three oxidizing agents, five sulfates of the strongly toxic metals, etc. A table of results is compiled, giving the coefficients of injury, inhibition, and death point. The author's summary includes many points, three of which we may quote, viz: "(1) Fungi are in general much more resistant to most deleterious agents than the higher plants. In the case of the mineral acids a concentration of from two to four hundred times the strength fatal to the higher plants is required to inhibit the germination of mould spores under favorable conditions. (2) Different species of fungi present great differences of resistance to many agents. Of the agents tested in this study, NiSO_4 permitted the greatest specific variation and dichloroacetic acid the least. (3) Particular forms of the same species present very different powers of resistance, depending probably on previous environment."

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THE LABORATORY OF THE U. S. FISH COMMISSION AT BEAUFORT, N. C.

THE laboratory of the United States Fish Commission, at Beaufort, on the coast of North Carolina, will be reopened for work on the first of June, and will remain open until October. The laboratory is designed for research in marine biology (zoology, botany, physiology), and, for the present, is open to men only. The collecting outfit is particularly good, including steam launch, sailboat, skiffs, dredges, trawl, seines, surface nets, etc. The indoor equipment embraces the usual apparatus, glassware, and

reagents, provided by marine laboratories. The more important works on the systematic zoology and natural history of the forms that are found on this part of the coast, will be on hand; and the current numbers of the more commonly used journals will also be received. Naturalists working at the station will find a collection of identified forms, illustrative of the fauna and flora of the region, together with a record of breeding times and local habitat of the species.

Beaufort is a pleasant village to which a few people come for a quiet vacation. The collections of the earlier naturalists, and the work of the Marine Laboratory of the Johns Hopkins University, stationed here under Professor Brooks for many years, made known the interesting character of the fauna—which is exceedingly varied and abundant, including most of the forms described for the South Atlantic coast. Research at the laboratory is untrammelled, it being assumed that every occupant of a table will, in the course of his investigations, add to our knowledge of the natural history of this part of the coast. Inquiries and applications for tables, for which there is no charge, should be addressed to the Commissioner of Fish and Fisheries, Hon. George M. Bowers, or to the director of the laboratory.

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PROFESSOR DEWAR ON SOLID HYDROGEN.

WE are able to print in the present number of SCIENCE an interesting address by Professor Dewar before the Royal Institution on his work on the 'Liquefaction of Hydrogen.' Professor Dewar has continued his researches and gave a further lecture before the Royal Institution on February 6th, an account of which we take from the *London Times*.

The theatre of the Royal Institution was crowded to its utmost capacity to hear Professor Dewar lecture on 'Solid Hydrogen.' Sir Frederick Bramwell was in the chair, and among those present were Lord Lister, Lord Rayleigh, Sir F. Abel, Sir W. Crookes, Sir B. Baker, Sir Henry Mance, Professor Odling, Mr. T. W. Swan, the Solicitor-General for Scotland, Dr.