duct researches in the metallurgy of iron and steel and allied subjects, with the view of aiding its advance or its application to industry. There is no restriction as to the place of research which may be selected, whether university, technical school, or works, provided it be properly equipped for the prosecution of metallurgical investigations.

The appointment to a scholarship shall be for one year, but the council may at their discretion renew the scholarship for a further period instead of proceeding to a new election. The results of the research shall be communicated to the Iron and Steel Institute in the form of a paper to be submitted to the annual general meeting of members, and if the council consider the paper to be of sufficient merit, the Andrew Carnegie Gold Medal shall be awarded to its author. Should the paper in any year not be of sufficient merit, the medal will not be awarded in that year.

By Order of the Council,

Bennett H. Brough,
28, Victoria Street, London. *Secretary.*

CURRENT NOTES ON PHYSIOGRAPHY.

THE WASHINGTON FOLIO.

The Washington double-sheet folio, by Darton and Keith, embraces a district in which the Potomac flows from its gorge in the Piedmont plateau to its estuary in the Coastal plain. Along the junction of the two areas is an 'inner lowland' similar to that so well developed in New Jersey, but of less breadth. It is determined on one side by the descending floor of crystallines on which the Coastal plain strata rest, and on the other by a pale and ragged 'cuesta' whose sinuous crest appears to be held up by the Matawan formation, overlapped by abundant later deposits, while the lowland itself is opened out on the clays and sands of the Potomac (Cretaceous) formation. The economic sheets give the underground contours of water-bearing strata. The structural sections exhibit the wonderfully even truncation of the steep-dipping crystallines in the Piedmont area. A novel feature is presented on the physiographic geology sheet, where the existing planes and slopes are colored according to the date of their production, and not that of the rocks on which they are carved. This brings out clearly the pre-Columbia dissection of the Lafayette plain, as well as the Columbia and later terraces, the latter having their greatest extension along the inner lowland between the old land and the cuesta.

PHYSIOGRAPHIC ECOLOGY.

'The Physiographic Ecology of Chicago and Vicinity, a study of the origin, development and classification of plant societies,' by Cowles (*Botan. Gazette,* XXXI., 1901, 73–108, 145–182), and 'The Genetic Development of the Forest of Northern Michigan, a study in physiographic ecology,' by Whitford (*ibid.,* 289–325), are essays in which the relation of plant distribution to land forms is carried to much more than ordinary detail. Not only is the existing distribution of plants traced out, but the extension of one plant society and the corresponding restriction of another, with the slow advance of physiographic development, as previously suggested by Woodworth, are here clearly pointed out, as in the discussion of the flora of ravines, valley sides and flood plains.

Studies of this kind are of especial interest to the physiographer from the use that they make of physiographic details; they are encouraging in the evidence that they give that the real intention of physiography is coming to be recognized. It is not so much an end in itself as a means to a larger end; hence it must concern itself not only with large features of earth form and climate, but with local details as well. It is particularly in these applications of physiography that an effective terminology will be demanded, for when the distribution of plant societies is followed out on so gently modulated a surface as that of a flood plain, nothing less than a systematic and detailed method of description will suffice. When not only biologists, but geographers and even travelers come to avail themselves of the results of physiographic study, the need of a careful terminology will be still more apapparent.

THE COAST-PLAIN OF NORWAY.

Under the title 'Søndre Helgelands morfologi' (*Norges geol. undersögelse,* No. 29,

1900, 1–61; German abstract, 160–170), Vogt describes the leading features of a part of mid-western Norway, including a typical portion of the coast plain whose general occurrences and origin by marine abrasion were first announced by Reusch in 1894, and whose forms were further illustrated by Richter (see SCIENCE, June 26, 1896). Between latitudes 63½° and 66½°, the coast plain, now much dissected and mostly submerged, has a breadth of about 45 kil., or a third of that of Norway in this district. It bears some large unconsumed eminences here and there. Its inner border lies along a tolerably direct line at an altitude of from 20 to 50 met., and is well defined by the rather abrupt ascent to the highlands whose altitude shows that some 400 met. of rock was worn away in abrading the inner part of the plain. Further inland, the highlands are too uneven to be regarded as an uplifted peneplain; but they have been heavily denuded, their summits are composed of their hardest rocks, and their summit heights show a marked accordance with a plane sloping seaward at an angle of 40′. Belts of limestone have been worn down in longitudinal valleys by which inland communication is favored. Transverse valleys, now occupied by fiords, lead to the coast. Returning to the coast plain, it slopes gently westward, and as it gradually dips under the sea thousands or tens of thousands of skerries fringe the shore line. Its outer edge is now at a depth of from 10 to 30 met., beyond which the bottom descends more rapidly. The slope of the plain is ascribed in part to post-glacial tilting (2½′), in part to an original declivity due to abrasion as the land slowly sank. The date of abrasion is given as pre-glacial, and the fiords and other channels by which the plain is intersected are ascribed largely to glacial erosion acting on lines of previously established valleys. The fiords reach depths of from 400 to 600 met. beneath the sea, or from 1,250 to 1,500 met. below the adjoining highlands; their depth decreases forward in the coast plains. The shore lines (strandlinjen) that were cut during the post-glacial submergence stand somewhat higher than the inner border of the abraded plain, with which they should not be confused.

SWEDISH GLACIAL LAKES.

HANSEN has shown that the shore lines of extinct lakes occur in deep east-discharging valleys that occupy a belt next east of the general watershed of the Scandinavian highlands, and that the barriers by which the lake waters were held consisted of residual ice masses; thus confirming the generalization that the iceshed of the glacial period (as determined by striations and boulders) lay somewhat east of the watershed. A special account of some of these lakes is given by Gavelin ('On the glacial lakes in the upper part of the Ume river valley.' *Bull. Geol. Inst. Univ. Upsala*, IV., 1900, 231–242, map). One of these lakes in lat. 66° was over 100 kil. long, with a width up to 9 kil., and a depth of 150 or 200 met. Its outlet was westward across a pass at an elevation of 534 met. Wave-cut terraces in till and stream-built deltas of gravel are traceable round the shore line, which rises eastward with a gradient of about 1:2,000. A higher water level is found at altitudes varying between 700 and 760 met. Many other shore lines of this kind await the attention of the explorer.

W. M. DAVIS.

BOTANICAL NOTES.

POPULARIZING FORESTRY INFORMATION.

MR. ABBOT KINNEY, of Los Angeles, California, has rendered forestry a good service by bringing out a pretty book entitled, 'Forest and Water,' in which he discusses in a non-technical way many things which bear upon our forests and their management as well as their mismanagement. In a series of short chapters the author discusses enthusiastically and earnestly, if not always learnedly, many things pertaining to trees and their environment. Thus he takes up the origin and continuance of forests, forest fires, pasturage in forests, need of government control, forests in relation to torrents, study of the pines, cedars and other trees, some relations between forests and water supply, forest reservoirs, etc. In speaking of forest fires the author says, "Fire is more dreaded than any