house, given in honor of Madame Curie. There were probably more than one hundred guests, including high government officials and the leading men of science in France. Madame Curie was very happy and cheerful the whole evening. In spite of the strenuous day she had had, she remained until a late hour.

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THE SUBMERGED COASTAL PLAIN AND OLDLAND OF NEW ENGLAND

THE coastal plain of New Jersey presents the normal features of a maturely dissected landform of its type: a cuesta with strongly contrasted gentle backslope towards the sea, and a steep inface towards an oldland of crystalline rocks from which it is separated by a broad inner lowland. In the Long Island region the inner lowland is largely submerged to form Long Island Sound; and very little of the coastal plain cuesta projects above sea level, much of the island consisting of overlying glacial débris. It would seem, therefore, that there was a progressively greater submergence of the coastal plain topography towards the northeast, and that we should explore the bottom of the Gulf of Maine and adjacent waters for a possible continuation of the topographic elements so well developed in the New Jersey region.

With this end in view the junior author prepared a series of 25 projected profiles extending from north to south and from east to west across the Gulf of Maine, and prolonged them to include adjacent land areas on the north and west, and on the south the region of the Banks to the edge of the continental shelf. For each north-south profile all the soundings shown within a belt of longitude 10 minutes wide on the U. S. Coast and Geodetic Survey charts Nos. 1106 and 1107 were projected upon a single vertical plane. This gave a much better idea of the submarine topography than could be derived from simple linear profiles based on a wholly inadequate number of soundings, but avoided the too great generalization of the topography which results from projecting belts of very great width. For the east-west profiles belts of latitude five minutes broad were similarly treated. The results obtained were checked at a large number of points by projected and linear profiles based on large-scale charts, and drawn both parallel to and normal to the general trend of the coast. For this latter series of profiles we are largely indebted to H. G. Bray, research assistant in physiography at Columbia University. Both series of profiles have been analyzed by the senior author, and compared with submarine profiles of regions to the north and south, in connection with a detailed study of the physiography of the Atlantic shoreline. Some of the results seem of sufficient general interest to deserve record here.

The profiles show that the Banks, extending from Nantucket Shoals past Georges Bank and Brown Bank, and on to the northeast, have in the region under investigation the typical form of a cuesta with gentle backslope towards the southeast and steep inface toward the oldland of Maine. The inface is in places an imposing submarine escarpment rising steeply from 700 to 800 feet or more above the floor of the deeply submerged inner lowland. The lowland floor is trenched by what appear to be normal river valleys, while the gentle backslope of the cuesta shows linear depressions, parallel with the inclination of the surface, which may represent traces of the consequent drainage system incompletely obscured through the deposition of débris by wave and current action. Both the gentle backslope of the cuesta and its steeper escarpment show minor cuestas such as are common to mature coastal plains comprising alternate layers of resistant and non-resistant strata. Two subordinate cuestas appear to extend some distance out across the floor of the lowland and to curve roughly in sympathy with the changes in direction of the main escarpment. The major cuesta may appropriately be called the "Banks Cuesta," and its general correspondence in form to the New Jersey cuesta is clearly established.

The analogy with New Jersey conditions extends farther. In New Jersey the oldland consists of crystalline rocks into which there has been down-faulted a great block of weak Triassic sandstones. Erosion of the sandstones in a new cycle following peneplanation has produced a lowland of faint relief, which merges with the inner lowland of the New Jersey coastal plain to give a very broad belt of low-lying land of subdued topographic expression. On the northwest the Triassic Lowland is bounded by a rectilinear fault-line scarp leading up to the relatively high and rugged crystalline upland which better resisted the agents of subaerial denudation.

The submarine profiles reveal all these topographic elements under the waters of the Gulf of Maine. On the northwest the crystalline oldland of New England slopes gradually downward toward the southeast to pass under the sea. For some distance seaward the rugged hill-and-valley topography can be traced in many of the profiles, until cut off by an escarpment, sometimes subdivided into two or possibly three branch scarps, beyond and below which the seafloor is usually less irregular. The escarpment has in one place a total height of nearly 1,000 feet, counting the combined elevations of two branches; but from one or two hundred feet to double that

amount is more common. One of its branches is beautifully shown on the Great Wass Island topographic quadrangle, where it has been regarded by some as a submerged wave-cut cliff; but the profiles show that this scarp can be traced far to the northeast where it rises above sea level and forms the rectilinear northwest shore of the Bay of Fundy, along which occasional remnants of Triassic sandstones are found in fault-contact with the crystallines; and far to the southwest under the sea with characteristics which seem to eliminate the possibility of its being a wave-cut feature. There can be little doubt that this great scarp marks the position of a major fault limiting the Fundian Triassic on the northwest, and to it the name "Fundian Fault" may be given. It is one of the great displacements of North America, and while its western limits are less clearly evident in the submarine profiles, the Fundian Fault can apparently be traced more than 350 miles from near the head of the Bay of Fundy to beyond the Isles of Shoals.

Southeast of the Fundian Fault the deeply submerged Triassic Lowland can be recognized in the profiles by its subdued topography, in strong contrast with that of the submerged crystalline upland with its rugged hills, and even distinguishable from the lowland developed on the lower formations of the coastal plain north of the Banks Cuesta. The Triassic Lowland topography seems traceable more or less continuously from well up the Bay of Fundy to the vicinity of Jeffrey's Bank, far out in the Gulf of Maine. Here the lower beds of the coastal plain appear to overlap obliquely from the south the Triassic formation, just as in New Jersey the coastal plain overlaps to a lesser extent the Triassic of that region. The great breadth of the Gulf of Maine, like the broad belt of low country in central New Jersey, finds its explanation in the fact that the inner lowland of a coastal plain merges with a weak-rock lowland in the oldland.

The submarine physiography of the Gulf of Maine lowland and the Banks Cuesta will be discussed more fully by the senior author in connection with other features of this coast in a volume to be published in the near future. It seems desirable, however, to point out at this time certain conclusions of importance which would seem to follow if the above interpretation of the submarine topography be correct.

The physiographic features revealed by the profiles are opposed to the interpretation of the Banks as in any appreciable degree the product of deposition at the margin of the continental ice-sheet, or of deposition from icebergs where cold and warm ocean currents meet. They are equally opposed to the suggestion that the Banks result, wholly or in considerable part, from a heaping up of débris where two great waves of the tide conflict, but support in a striking manner the opinion of those who have considered the Banks as a continuation of the Atlantic coastal plain. Fishermen bring up from the Banks fossiliferous limestone and sandstone, specimens of which were collected by Upham and determined by Verrill to be of Tertiary age. Whether or not the continental glacier be credited with transporting Tertiary material from the region of the inner lowland to the summit of the cuesta, these records fix roughly the age of at least a part of the coastal plain deposits.

A coastal plain which is very broad in Georgia-Alabama, much narrower in Virginia-Maryland, still narrower in New Jersey, and gradually disappears in the Long Island-Martha's Vineyard region, is found fully developed but wholly concealed beneath the waters of the Gulf of Maine. This emphasizes in an impressive manner the fact that in recent geological time, since the Tertiary coastal plain beds were uplifted and dissected long enough to open out a broad inner lowland, the Atlantic side of the North American continent has suffered a differential subsidence greater at the northeast than at the southwest. It is this differential subsidence, admitting the sea to overflow part of the Appalachian oldland from New England north, while farther south it is for the most part held at a distance on the still but partially submerged coastal plain, which has created the fundamental contrast in the physiography of our northern and southern shorelines.

In the depth of the floor of the inner lowland below sealevel we have a minimum measure of the extent of the submergence of the New England coast which is seemingly more reliable than that afforded by the submarine channel of the Hudson and other similar forms. The lower parts of these channels are very imperfectly known from soundings too few in number to permit their real forms to be contoured; and Davis has recently expressed the conviction of more than one physiographer when saying that the whole problem of submarine trenches is an open one, and that it may be found advisable to explain them all (the writers would say "some of them") as the product of submarine agencies, without the aid of changes of level. But of the subaerial origin of a typical cuesta and broad inner lowland, with all the associated features revealed by the profiles across the floor of the Gulf of Maine, there would seem to be no doubt; and in this drowned inner lowland we find convincing evidence of a geologically recent submergence exceeding 1,200 feet. How much greater it may have been is not clear, although the position of the lowland with respect to the edge of the continental shelf is such as to suggest that if the land was recently several thousand feet higher than now, as some have believed, it must have maintained so great an altitude for a very brief period only.

It is obvious that a geologically recent stand of the

land 1,200 feet or more higher than now, for a considerable period of time, may have an important bearing on certain problems of plant geography. Fernald has shown that many species of plants characteristic of the Pine Barrens and Coastal Plain floras of New Jersey and the south occur at various points along the New England and Acadian coasts, and even on Newfoundland; and he believes these species could reach their present position only by spreading along a sandy land bridge such as would be provided if the banks were to project above sea level. Following Daly he appealed to a lowering of sea level during the glacial epoch to lay bare the crests of the banks. Barrell pointed out that this would require the migration of the flora during a cold period, whereas the evidence indicates that such migration must have taken place when the climate was as warm as, or warmer than, that of the present; and he suggested a local bulging up of the Banks zone, marginal to the ice sheet, while the mainland was weighted down by the ice, followed by further uplift as the ice melted and the rising mainland carried the marginal zone up with it for a time. The submarine physiography of the Gulf of Maine indicates that prior to the advent of the ice the land stood so high that there were no such broad channels of open water as must have separated certain of the Banks on the theory of a more limited lowering of sea level due to glaciation; while instead of a temporary land bridge due to bulging at the margin of the glacier we apparently had relatively permanent normal coastal plain conditions continuously from New Jersey to Newfoundland. It seems most probable that the plant migration took place prior to the ice advance, when conditions for such migration apparently were most perfect and most long-enduring; and that remnants of the flora survived that ordeal on favored parts of the coastal plain. If this be true, the botanical problem may in large measure be independent of changes of sea level due to glaciation, and of marginal bulging due to crustal readjustment under the weight of the ice; although it must be recognized that both of these factors may have played an important rôle in the later history of the Banks Cuesta.

Professor Fernald in his later writings has clearly recognized the possibility of a preglacial migration of the Pine Barrens flora to its far northern position; and in response to an enquiry as to whether there is anything in the botanical evidence as known to-day to negative such migration in preglacial time, he replies: "There is absolutely no botanical reason, so far as I can see, why this might not have been the case. In fact, there are certain rather striking points which would indicate that a migration in late Tertiary or early Pleistocene times took place."

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SCIENTIFIC EVENTS

THE COMMISSION OF INTELLECTUAL COOPERATION

THE Report of the Commission of Intellectual Cooperation of the League of Nations, made September 1, 1923, reports the following transaction at their meeting of July 27.

Mr. Lowes Dickinson presented the following resolutions:

1. The task which presents itself immediately to this commission which is of the greatest urgency, is to obtain help for the universities of European countries which are in distress.

2. This help will be distributed impartially among all countries in distress, no matter whether they are members of the League of Nations or not.

3. The commission will endeavor to collect funds by addressing themselves to universities, institutions and societies in America and other countries that have suffered less, and will enter into communication with all organizations that pursue the same ends as, for instance, the Universities Committee of the Imperial War Relief Fund in England.

4. A separate commission will be charged with the organization of this work.

In discussing this proposition Mr. de Reynold desired to extend the help offered to scientific institutions other than universities. He said that in Germany, for instance, the universities rely upon the support of the state, while private institutions (libraries, scientific societies, etc.), whose scientific importance is very great, often need more assistance than universities. He offered the following substitute:

1. The commission approves heartily the creation of national commissions for intellectual cooperation such as have been founded in Central and Eastern Europe, and it congratulates the organizers. It sees in these commissions the best means of organizing intellectual cooperation.

2. The commission decides to extend these organizations not only over countries which have suffered particularly through the war, but also over those countries in which intellectual life is continued under the most favorable conditions.

3. The commission decides also to invite existing national commissions and those which may be formed to designate delegates to meet with the commission in order to study the most proper means of organizing intellectual cooperation.

4. The commission invites the experts in charge of the investigation of the state of intellectual life in those countries in which this life is particularly menaced to continue their investigations in such a way as to give a report on the most urgent needs of the various countries.

In commenting on these resolutions he remarked particularly upon the difficulty of obtaining informa-