a map should be revised at frequent intervals, say of five to ten years, in order that it may show new conditions as to cultural features.

The Temple Act authorized the acceptance by federal bureaus charged with mapping the country of funds from states or subdivisions thereof, which might wish to have the mapping of their areas expedited. It was not mandatory that the states should make contributions towards the mapping.

Under the present national mapping plan, provision is made whereby funds may be received for expediting the mapping in any particular area or in making larger scale or more detailed maps than what are ordinarily called the standard maps.

Topographic maps must be based upon geodetic or control surveys which furnish the latitudes, longitudes and elevations of great numbers of monumented points on the earth's surface, together with distances and azimuths between adjacent points. With emergency funds the Coast and Geodetic Survey has during the past three years added much to the control survey nets of the country. There are now in the United States about 261,000 miles of lines of levels, and 67,000 miles of arcs of triangulation. The plan that has been followed is to have the lines of levels and arcs of triangulation spaced at intervals of approximately 25 miles. So far as the leveling is concerned, the 25-mile spacing has been completed to the east of the 102° meridian. To the west of that meridian some additional leveling must be done to secure the 25-mile spacing. There remains approximately 47,000 miles of arcs of triangulation to finish the 25-mile spacing of the net.

Much more control surveying will be needed to furnish the basis for topographic mapping. Within the 25-mile meshes of the nets will be needed horizontal and vertical control survey stations placed at intervals of from 5 to 7 miles in order to supply the topographic engineer with a sufficient number of control stations.

Airplane photography will no doubt be used to a great extent in the mapping of the country. The data shown on the photographs taken from the air can be fitted into the control stations that may be plotted on the map, and thus topographic features, such as roads, railroads, shore lines, rivers, streams, forests, settlements and even individual houses, can be placed on the map in their true geographic positions. The so-called planimetric map made from airplane pictures can be taken to the field and the topographic engineers can draw on them the contours representing elevations and slopes. There are also now in use a number of instruments with which contours can be plotted from airplane pictures, using optical methods. This is a new and as yet very limited development in topographic mapping.

Undoubtedly the mapping plan will be put into effect, but just how soon no one knows. When we consider the cost of completing the mapping of the country in terms of human energy or man-years, we find that the cost to our people is almost insignificant. Measured in dollars we may think it is high. However, ten million dollars per year for each of ten years would be the equivalent of the cost of only 2,000 miles of modern highways or 200 miles per year. We are spending hundreds of millions of dollars per year on highways and I feel confident that if we had good maps from which to select the routes for the highways, great economies would be effected in the highway work. The best routes could be selected and the maintenance charges for the roads based upon the maps would be less than for those highways constructed in unmapped areas.

Elevation and slope bear a definite relationship to animal and plant life. Maps would more than justify their cost by their use in the plant and animal industries of the country alone. With the maps there could be far better control of those organisms that influence favorably or unfavorably plant and animal life.

I suppose that the real reason that the mapping of the country has not been carried on more vigorously in the past is that there has been no concerted action on the part of those whom the maps would benefit. Individual action does not carry as much weight as does united effort based on unified opinion. Whether there will be a concentration of effort on the part of map users to have the plan put into effect, no one knows, but it is reasonably certain that we are becoming map-minded. It is unfortunate that we have so few maps in a map-minded age.

SCIENTIFIC EVENTS

PLANS FOR THE DEVELOPMENT OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

A DEVELOPMENT program which will make the Academy of Natural Sciences an active part of Philadelphia's educational system was announced by its president, Effingham B. Morris, at the formal opening on January 16 of the new East African water-hole habitat group in the Free Museum of the academy. Dr. James Bryant Conant, president of Harvard University, and Dr. William Berryman Scott, emeritus professor of geology at Princeton University, who

spoke at the gathering, urged the carrying out of this program which embodies these three main objectives.

The meeting was attended by prominent educators, naturalists and museum officials of Philadelphia and other cities, as well as by representative Philadelphians in social and civic circles. Mr. Morris, who gave the opening address, gave an outline of the history of the academy. He said that when the trustees began to study what should be done to meet increasing public demands, many avenues of approach suggested themselves. They were finally narrowed down to three main objectives for immediate consideration, as follows:

> The first objective is the further development of our museum. We want a museum where *ideas* are on display rather than *things*. We are, therefore, starting a study that will result in a definite plan based upon the best advice and authority that we can get.
>
> Second, we are going to render a more active service to the school children of Philadelphia. Last year some 30,000 came to the academy, some from such relatively distant points as Atlantic City and Reading. It is our intention to build a plan whereby the academy will provide them with a more concrete service. There are many things that can be done—guides, special courses, loan collections, trips, lectures, and natural science clubs are only a few of them.
>
> Third, and last of these first steps, is the reestablishment of a department of paleontology. In this field we have the opportunity of building a department that does not duplicate the work of near-by institutions, and of filling a great gap. The academy has the collections and a great heritage in the work of such men as Leidy and Cope. Given a scientist who can put their collections in order, and make them available for study, we can render a real service. And I want to emphasize the fact that this is merely the entering wedge—the instrument that will show the practicability of closer cooperation with *all* the departments of the academy.

This program will be carried out under direction of an executive committee headed by Arthur E. Newbold, Jr., treasurer of the academy and a member of its board of trustees. The following trustees will serve as chairmen of the three committees: Museum Development, Frank B. Foster; Educational Cooperation, J. Stogdell Stokes; Department of Paleontology, Edgar B. Howard.

ANNUAL REPORT OF THE DIRECTOR OF THE NEW YORK BOTANICAL GARDEN

AT the annual meeting on January 13 of the trustees of the New York Botanical Garden Henry W. de Forest was reelected president; Henry de Forest Baldwin was reelected vice-president; John L. Merrill vice-president and treasurer, and Dr. Marshall A. Howe director and secretary.

Elective managers chosen for a 3-year term include Arthur M. Anderson, of Bedford, N. Y.; Clarence Lewis, of Sterlington; E. D. Merrill, of Harvard University (who until October 1 was director of the garden); Lewis Rutherford Morris, of New York City; Dr. Marshall A. Howe, Henry W. de Forest and Henry de la Montagne, Jr. Mrs. Samuel Seabury, Edward C. Delafield, Dr. Tracy E. Hazen, Mrs. Henry J. Fisher, Mrs. Frederick A. Godley, Mrs. Geo. McM. Godley, Mrs. William F. Hencken, Mrs. Henry F. Schwarz and Mrs. Townsend Scudder, were elected to membership in the corporation.

Dr. Howe, who before his election as director had been assistant director of the garden for eleven years, presented his first report. He emphasized horticultural displays of the garden and its increased services to the public.

Reviewing the scientific achievements of the staff he referred to the breeding of useful and decorative varieties of plants, research into the background of this work, and the identifying of many thousands of pressed plants. He reported the addition of nearly 54,000 specimens to the herbarium, raising the total number of specimens to 1,800,000. He acknowledged the botanical books that have appeared in the last year under the signature of staff members—notably Dr. H. A. Gleason's "Plants of the Vicinity of New York" and Dr. John K. Small's "Ferns of the Vicinity of New York." He called attention to the work of the 100 to 200 WPA employees, who have given substantial help during the year in clerical, scientific and specialized work indoors, and in gardening and construction and repair work both inside and out. He spoke at length on the numerous floral exhibits of 1935, through which the garden had been able to acquaint the public with suitable plants in great variety for out-of-door and indoor growth.

Cooperating with other institutions, the garden during 1935 gave away more than 48,000 duplicate herbarium specimens, and received nearly as many different ones in exchange. In addition, more than 17,000 sheets of pressed plant material were sent out on loan for students all over the world.

As a special service to members, choice shrubs, waterlilies, begonias and iris were distributed during the year. Six thousand packets of seed were mailed to 134 other botanical gardens and institutions, besides individuals, and 4,730 packets were received in return.

Dr. Howe also called attention to courses given at the garden, which are attended by members, professional gardeners, teachers and others.

THE NORTH AMERICAN WILDLIFE CONFERENCE COMMITTEE

IN calling the North American Wildlife Conference for February 3–7, President Roosevelt said: