GENERAL SCIENCE

Scientists to Advise Nation

President's Science Advisory Board Expires, But New Body is Formed; $3,500,000 Research Fund Proposed

MOBILIZATION of the best scientific minds of the nation to aid government scientific work and an appropriation of $3,500,000 for scientific research by non-governmental institutions during the next two years are proposed by the report of the Science Advisory Board to President Roosevelt. The term of appointment of the Board lapsed on Dec. 1.

However, scientists' advice will continue to be available to Government departments, through a new advisory body of non-governmental research men. The new group was organized by the National Academy of Sciences, in response to a request from President Roosevelt transmitted to the Science Advisory Board and published in its final report, just off the press.

"Our national health, prosperity and pleasure largely depend upon science for their maintenance and their future development," the report declares. National welfare is dependent upon adequate scientific information, the report states, independent of political theories. Science is "basic to attempts at national planning or improvement of any kind or degree."

The Science Advisory Board looks with approval upon the government's scientific services which supplement other government activities, such as the scientific aids to national defense and the development of standards for the purchasing of supplies for governmental use.

Commendation was also given to such activities as those of the National Advisory Committee for Aeronautics which "hold evident promise of benefiting the public but which are not proper or practical fields for private initiative."

The Importance of Maps

Freedom of scientific work from political or policy-making influences is also given as a prime consideration.

Great public works and large-scale private enterprises alike depend on accurate maps; and at present the map-making activities of the government are scattered through 28 different bureaus and offices, with resulting inefficiency and money waste. To remedy this situation, the report recommends the establishment of a central mapping and survey agency.

Not all of the 28 existing map-making agencies will be combined at the outset, if the Board's recommendations are adopted. They stress the desirability of making haste slowly. The new body, for which the name U. S. Coast and Interior Survey is suggested, would be formed by the merger of the present Coast and Geodetic Survey, the Lake Survey, the International Boundary Commission, and the Topographic Branch and Division of Engraving and Printing of the Geological Survey. It is anticipated that other mapping agencies, at present left unchanged, would in the course of natural events gravitate into this nuclear organization.

Certain existing mapping and survey bodies are already so well organized, or have such highly specialized work to do, that they would probably never be changed. In these latter categories, the Board's report mentions the Soil Conservation Service, the Army Air Corps, the Federal Power Commission and a number of others.

Complete Topographic Work

The Board stresses the urgent need for completing the standard topographic map of the United States, of which now only about 25 per cent. exists in really acceptable form. Such a map, showing not only the outlines of things but accurately indicating mountains, valleys and all other grades of elevation, would pay for itself through savings on highway work alone, the report declares, continuing:

"But it is not in respect to highways alone that the need is urgent. All drainage, flood control and irrigation projects, water supply and power developments, mining operations, land classification, soil studies, location of railways, canals, sewers, transmission lines, parks and recreation centers, and an endless variety of other engineering, industrial and civic developments are peculiarly dependent on good topographic maps. Intelligent national, state and municipal planning is impossible without adequate maps, and the large programs recently undertaken have resulted in an unprecedented volume of requests for these indispensable tools of ordered progress. The New Deal has brought for maps a New Demand."

Recovery of American industry can be greatly aided by bringing American patent law and procedure up to date, the report declares. The end of a depression is normally marked by a great increase in inventive activity, and it is in anticipation of this upswing that the Board makes its recommendations, to facilitate the handling of the flood of Patent Office business and to speed up the use of the new ideas in industry.

Patent Reforms Proposed

Three changes in American patent procedure are proposed by the Board:

First: Descriptions of the article or process to be patented should be published in the Official Gazette of the Patent Office before the patent is granted, and not afterwards as in the present procedure. Persons with conflicting claims would be invited to state their case, and after a consideration of all evidence the patentability of the idea in question would be decided. It is believed that many hundreds of duplicate patents that now slip by the examiners could be caught by this method, and also that a great deal of the present endless patent litigation could be obviated.

Second: A special patents court should be established, with judges qualified in science and engineering as well as in law. This court would be far better qualified to handle questions of fact than present legal bodies can be expected to be, and for this reason alone would doubtless speed up the disposal of patent cases.

Third: A corps of specially trained patent advisers should be made available for the assistance of courts trying patent cases. These men would be scientists and technicians rather than lawyers. They would represent, in patent practice, the non-partizan expert witnesses hired by the court, whose substitution for the witnesses hired by contesting parties has been recommended for general court procedure.

The Board also favors the adoption of some system of taxing patents once issued, to discourage inventors or purchasers of inventions from letting them

lie idle and unused, as is often the case at present. This method of eliminating "dormant" patents has been used with success in certain European countries. The Board also recommends, however, that some reduction be made in the present cost of securing a patent, to offset the increased costs involved in the patent-taxing system.

Better pay and better working conditions for the Patent Office personnel are held desirable, and the suggestion is made that members of the force be given opportunity to visit leading factories, power plants, etc., to keep them up to date on the current uses of patents in industry.

Science and Land Use

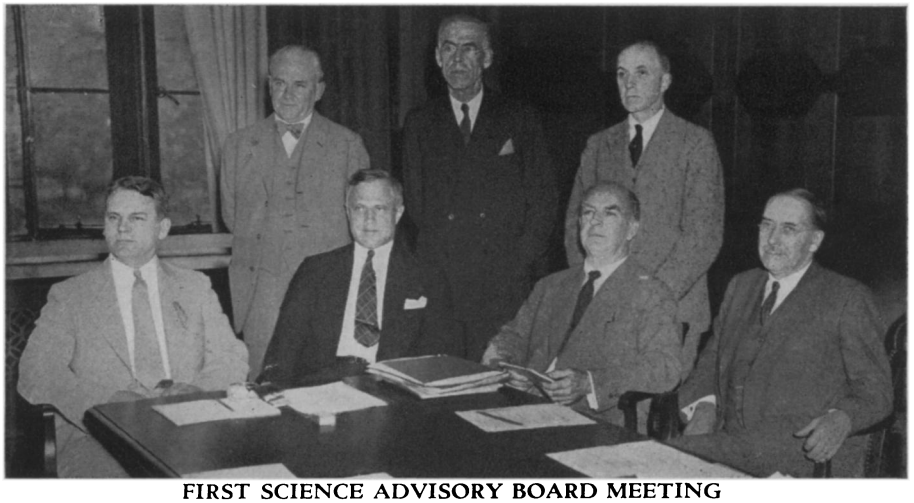
Scientific research along new lines is needed for the formation of an intelligent and soil-saving land use policy in this country, the Science Advisory Board stated. Several recently developed lines of approach give new viewpoints, and present information in much more practically usable form.

Outstanding of these modern methods is the concept of "climatic areas" developed by Prof. R. J. Russell of Louisiana State University. From this approach, a desert, grassland or other climatic-geographic unit is not regarded as a fixed area drier in some years and wetter in others. It is rather seen as a type of climate dominating an area that expands in some years and contracts in others. Thus, the desert region of the West moved its boundary eastward during the great drought; and during the recent fall the rain-dominated Southeast pushed its boundaries toward the north and west.

The Changing Desert

A system of climatic area maps of this kind, it is pointed out, will be of great service in planning for the future, especially in regions of "climatic risk." If such information had been available in pioneer days, many of the "starvation lands" on the Plains would never have been offered to settlers. If it had been available even as recently as twenty years ago, it might have been possible to avoid breaking the age-old Western sod to plant wheat, with the inevitable consequence of country-wide dust storms during the past three years.

Another type of research called for concerns the physiological requirements of crop and forest plants. A great deal of dispute has gone on recently about the possibility of growing trees at all in the Plains shelterbelt area. Even experts have disagreed, simply because full knowledge is lacking of the behavior of various tree species under Western low-moisture conditions. Similarly, many losses have been incurred through the planting of field crops where they cannot be expected to pay: corn too far north, for example, or wheat too far south.



FIRST SCIENCE ADVISORY BOARD MEETING

At the first meeting in the National Academy of Sciences Building, Washington, August 23, 1933, were these scientists: (SNL, Aug. 19, 1933) Left to right—Drs. Bowman, Millikan, Compton, Leith, Campbell, Jewett, and Merriam.

Similar studies on native vegetation and animal life, called phenology by scientists, are needed, the report states. Phenological research makes year-by-year records of such things as the flowering and fruiting of plants, the migration and nesting of birds. Since these native species have become well fitted into the conditions of their environment, full phenological data will often yield information about soil and climate of a given region in less time and at much lower cost than is possible by other methods.

More money for public health work will buy more health for America.

Campaigning for Health

This implication is contained in the report of the Science Advisory Board. The Board recommends an increase of $2,000,000 in the 1936 budget of the U. S. Public Health Service. If obtained, this would mean about 40 per cent. boost in funds actually available for research and allied activities of the Service; for of the present budget of approximately $10,000,000 about half is expended on Government hospitals.

Justification for increased support for the work of the Service is found by the Science Advisory Board in the record of achievement in the past. Not only has the Service done yeoman work in what might be called its regular day's job, but a number of its scientists have made brilliant medical discoveries whose effects have been world-wide. The report cites, among other achievements, the classic work of Dr. C. W. Stiles on hookworm and methods for combating it, the discovery of the cause of tularemia by Dr. G. W. McCoy, the development by Drs. R. C. Spencer and R. R. Parker of a vaccine against Rocky Mountain spotted fever, and proof, developed by Alice Adams, that undulant fever in human beings and contagious abortion in cattle are caused by the same type of bacteria.

Much Service in Little Time

The Science Advisory Board, an unpaid, unofficial body, functioned from July 31, 1933 until Dec. 1, 1935. Its committees made studies and offered findings of which use was made in such governmental activities as the reorganization of the Weather Bureau, the establishment of the Soil Conservation Service, and the survey of mineral, water and soil resources. Still pending, and to be continued under the new set-up, are the researches of committees cooperating with the War and Navy Departments, the Patent Office, and the Weather Bureau.

New successes have been scored by a committee of the late Board in studies on design and construction of airships, which should result in the building of stronger and safer craft. They have found mathematical solutions for certain stress analyses, for which only approximations have been available up to date.

The Committee on Signalling for Safety at Sea has also (*Turn to page* 378)

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been able to indicate possible advances in methods for guiding ships on the high seas and in approaching and maneuvering in harbors. Some of the methods used are peace-time adaptations of ideas first tried during the World War, and others make use of some of the newer developments in short-wave radio.

The original Science Advisory Board, as first appointed by President Roosevelt, included Dr. Isaiah Bowman, President, Johns Hopkins University, then chairman, National Research Council and director, American Geographical Society; Dr. R. A. Millikan, director, Norman Bridge Laboratory of Physics, California Institute of Technology; Dr. Karl T. Compton, *chairman*, president of the Massachusetts Institute of Technology; Dr. C. K. Leith, University of Wisconsin; Dr. W. W. Campbell, then president, National Academy of Sciences; Dr. Frank B. Jewett, president, Bell Telephone Laboratories; Dr. John C. Merriam, president, the Carnegie Institution of Washington; Gano Dunn, president, J. G. White Engineering Corp.; and Dr. Charles F. Kettering, president, General Motors Research Corp. The following members of the Board were appointed at a later date: Dr. Roger Adams, University of Illinois; Dr. Simon Flexner, Rockefeller Institute for Medical Research; Dr. Lewis R. Jones, emeritus professor of plant pathology, University of Wisconsin; Dr. Frank R. Lillie, then at University of Chicago and now president, National Academy of Sciences and chairman, National Research Council; Dr. Milton J. Rosenau, Harvard School of Public Health; and Dr. Thomas Parran, State Commissioner of Health, New York.

Science News Letter, December 14, 1935

PHYSICS

Short Wave Radio Effect Found Confirmed by Records

EXISTENCE of the "Dellinger effect," which is the sudden disappearance of short-wavelength radio signals over long distance, is confirmed by the National Broadcasting Company's studies of radio transmission records.

The complete wipe-out of all high-frequency long-distance radio signals on the illuminated side of the globe for short periods is known in commercial parlance as a "drop-out," O. B. Hanson, NBC chief engineer, explained.

Dr. J. H. Dellinger, chief of the National Bureau of Standards' radio section, reported the phenomenon recently and asked other observers to give their experiences. (See *SNL,* Nov. 9) It was seemingly linked to activity on the sun.

"It is one of the vagaries of short wave transmission but our experience indicates that it is a feature of the 27 day cycle of recurrent magnetic disturbances rather than a 54 day cyclic phenomenon," Mr. Hanson said. "During the year 1930, for instance, when magnetic disturbances were unusually extensive, such drop-outs were quite common and were predominantly linked with the 27 day disturbance sequences."

Confirmation of the Dellinger effect was also found in a check of Harvard's short wave radio transmission records since 1933.

Antiquated and now-obsolete government radio regulations are preventing scientists from obtaining needed information about the newly-discovered strange wiping out of short wave radio transmission, Dr. Harry Rowe Mimno of Cruft Laboratory, Harvard University, said in reporting the Harvard confirmation. (*Science,* Nov. 29).

Just as a search of old astronomical photographic plates can tell past information about a new star after it has been discovered, so too have Dr. Mimno's radio records described the severe radio fading which every 54 days appears to stop communication on certain short wavelength bands outside the usual home broadcasting range.

It would be highly desirable, Dr. Mimno indicates, to obtain with automatic equipment a continuous record of radio transmission reception during the recurrent radio "storms." But this was impossible he reports, stating:

"Unfortunately no continuous automatic records could be obtained during the 1935 period covered by Dr. Dellinger's report. During the past 16 months the Federal Communications Commission has repeatedly postponed the rephrasing of certain obsolete regulations limiting the use of automatic apparatus, which effectively block the continuation of fundamental research."

Science News Letter, December 14, 1935

BIOLOGY

Did Life Originate In Unknown Outer Space?

DID LIFE, at least the primitive one celled beginnings of it, come to our planet from somewhere else? Are we the descendants of protozoic or protophytic ancestors that "came over" on some meteoritic Mayflower?

Evolution, which has tolerably ready answers for many questions as to how life changed from one form to another, has never had a satisfying solution for the riddle of life's origin itself. Darwin never ventured an answer to this ultimate question, and even after he had become an agnostic he did not change the last sentence in the *Origin of Species,* in which he postulated life as "having been originally breathed by the Creator into a few forms, or into one."

Some speculative biologists and philosophers have undertaken at least to banish this baffling puzzle from this planet, by suggesting that bacteria or other low forms of life may have drifted into the fertile pastures of a young earth, or been borne in from outer space, riding on or in a rushing meteorite.

This view appeared to have gained support at one time through the experiments of Prof. Charles B. Lipman of the University of California, who has found bacteria in all sorts of unlikely places: in coal from deep mines, in the center of large rocks, and finally buried in the masses of stony meteorites.

But now doubt is cast on the validity of his findings, through a repetition of his experiments by a member of the Field Museum staff, Sharat K. Roy, who is versed in the techniques of both geology and bacteriology. Mr. Roy used material from several of the same meteorite falls as those investigated by Prof. Lipman. He sterilized the outsides of these "heaven-stones," tested them to make absolutely sure that they were sterile, crushed them to powder, and planted the powder in a series of twelve tubes of nutrient media.

Nine of the tubes remained without signs of life after weeks of careful incubation. Three showed colonies of bacteria. But when these were examined, it was found that the organisms were common forms on earth. They had either seeped into the stone through crevices and pores, or (more likely) they had somehow got into the culture tubes as accidental contaminations.

So again the concept of life as a celestial hitch-hiker runs up against a Scotch verdict.

Science News Letter, December 14, 1935