By way of illustration I should like to cite some of the work of the Bureau of Biological Survey. Let it be granted that all possible economies should be made and it is also possible that some reorganization or shift of emphasis may be desirable in the Biological Survey as elsewhere; but such economics and reorganization should be undertaken intelligently, with due regard to the importance and balance of the activities concerned. Unfortunately the evidence, as indicated in the reductions of last year and the present proposed budget, gives little indication of such a study of the situation having been made. In the case of the Biological Survey, for example, the policy appears to have been to continue the regulatory functions and to cut out completely the fact-finding activities on which all sound regulation policies must be based. This action would appear to have been inspired by the recently promulgated fallacy that science has already produced more results than the economic system has been able to absorb and therefore science should take a vacation and allow the social order to catch up.

In the budget now before Congress the appropriations for investigations on migratory birds, the food habits of birds, and diseases and other problems of fur-bearing animals, are not merely reduced, they are completely eliminated. Let us take the case of the migration studies as an example and see what the consequences would be. The Migratory Bird Act and the broad problems of bird refuges, the use of submarginal lands and the like, depend for their intelligent administration on knowledge of the abundance, distribution, migrations and other habits of birds. For many years the Biological Survey has been accumulating information on these points, but no matter how complete such information may be at one time it will not answer future needs any more than economic remedies of to-day can be based on the census of 1900. But even more important, by means of cooperative banding of birds on a large scale, the survey has in recent years built up an agency for gaining definite information on the movements and life histories of birds which is producing results of the greatest scientific and practical value. Approximately 1,900 persons, scattered all over the country, are cooperating voluntarily in this work. Since 1920 at least one and a half million birds have been banded and "returns" have been obtained on at least 90,000 of them. If the voluntary work that has gone into the obtaining of these invaluable records had to be paid for it would certainly run up into the hundreds of thousands of dollars. It should be pointed out that the large function of the Biological Survey in this work is to act as a repository and clearing house for the records that are accumulated through the efforts of these hundreds of voluntary collaborators. If the directive and coordinating work of the survey should stop, not only would it result in a complete paralysis of the banding operations, but records of inestimable value on birds already banded would be lost, and a smoothly functioning machinery would be destroyed which would require years to replace. Furthermore, the present highly skilled direction and supervision would be dissipated and could not be reassembled without much delay in time and effort, if at all.

The success of bird-banding as a method of gaining definite information has stimulated many special studies by individuals, by colleges and by state conservation bodies. The Biological Survey has cooperated by supplying bands and acting as a central repository for all records of recovery. Termination of this service would place a great handicap on such studies since, if each were to issue its own series of bands, inefficiency and hopeless confusion would result. To continue this particular activity of the survey on at least a functional basis would require $12,000 to $15,000 annually, while $20,000 to $25,000 would enable it to do its work effectively and well. It may be necessary in these times to reduce the work to a minimum effective operating level; but if the New Deal produces the results that are hoped for it, it is surely consistent with sensible economy to see that essential parts of the government's research program are not allowed to disintegrate.

What has been said with regard to the bird-banding work would apply with equal force to other fundamental research and "clearing-house" activities, not only in the Biological Survey but in the Department of Agriculture as a whole and in other government branches. If, in the zeal to speed recovery, research activities fundamental to government administration and regulation are in danger of neglect, to the point where they are seriously crippled or completely disorganized, it is a matter of grave concern not only to persons interested in the welfare of science, but to the general public as well. It is greatly to be hoped that some system of government budget-making may be devised whereby the needs of different activities may be evaluated and coordinated on a basis of logic and reason, rather than to be left largely to the whims of chance or to pressure exerted by specially interested or political groups.

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THE LAW OF MULTIPLE PROPORTIONS

IN the January 5, 1934, issue of SCIENCE, Professor E. A. Vuilleumier points out that the law of multiple proportions (as ordinarily stated in text-books) does not hold true, even for some standard text-book prob-

lems. He suggests the addition of a codicil so that the law reads "the ratio of small whole numbers or their reciprocals." This addition is not necessary, but it is necessary to omit the word "small" from the ordinary statement of the law so that it reads "the ratio of whole numbers."

This statement of the law takes care of the oxides of nitrogen problem discussed by Professor Vuilleumier. For a fixed weight of oxygen the weights of nitrogen in the several oxides are exactly in the ratio of 60 : 30 : 20 : 15 : 12. The same statement also provides for cases such as palmitic, stearic and oleic acids, where the weights of hydrogen for a fixed weight of oxygen are in the proportion of 16 : 18 : 17. Organic chemistry supplies many such cases.

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THE UNITED STATES BOTANICAL GARDEN

GEORGE HESS, director of the United States Botanical Gardens is retiring (as emeritus?). This is a time when all scientists, botanists in particular, should address their senators asking that the director of the U. S. Botanical Gardens should be a scientist, a botanist, who will make the gardens a Botanical Garden in fact. At present it exists purely for the propagation of plants for friends of congressmen, and for providing decorations for congressional functions.

A scientist could cater to such needs and yet develop a real botanical garden in the national capital. Years ago Dr. Liberty Hyde Bailey asked that either Congress develop a Botanical Garden of that project, or change the name. Nothing was done; it continues to *"fill* orders from congressmen" *without a botanical* background.

This administration seems to be doing things differently—maybe they will follow Bailey's suggestion if it is called to their attention by their scientific constituents.

The gardens are under the direction of the Library of Congress Committee, consisting of A. W. Barkeley, of Kentucky; K. McKeller, of Tennessee; E. Thomas, of Oklahoma; Hattie Caraway, of Arkansas; P. Norbeck, of South Dakota; S. Fess, of Ohio; W. W. Barbour, of New Jersey, and E. Gibson, of Vermont. Letters should be sent to the Senator of your own state.

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REPORTS

MEMORANDUM ON THE ALL-UNION INSTITUTE OF EXPERIMENTAL MEDICINE[1]

PRELIMINARY conferences on the plans of the All-Union Institute of Experimental Medicine have dealt entirely with technical matters on construction, arrangement and equipment. It seems desirable to conclude these conferences with a general statement.

I preface my remarks by calling attention to my own limitations, which are those of one who for many years has taken no personal part in laboratory research, but whose attention has been confined to the planning and administration of medical institutions and to public health work.

Of the general aims of the institute, I can speak only with admiration and approval. No individual, no foundation and no government has hitherto entered the field of experimental medicine with a scheme of equal proportions. The history of scientific medicine is a record of the efforts of mankind to elicit and to explain the facts of life, and to protect itself from danger, discomfort and death. In modern times both hereditary and environmental influences have been intensively studied. In the larger and more advanced states, prior to the world-wide depression, capital was poured into the construction and equipment of institutions dedicated to the study and prevention of disease. The volume of this work in the United States has been enormous. It has been carried on in many laboratories scattered over the entire country. The greatest of these establishments has a comparatively meager program in comparison with the ambitious, comprehensive program of the All-Union Institute of Experimental Medicine, which aims at the eventual command of all the natural and social forces which affect human life.

In the United States, coordinated medical research programs are found chiefly in a few famous institutes and in so-called medical centers, consisting of groups of hospitals whose main object is the treatment of the sick; in these centers, scientific investigation is very largely a by-product, albeit an important one. But, as I have already intimated, no single institution possesses anything like the resources with which it is proposed to equip and endow the institute in Leningrad.

The basic principle of the Leningrad institute might be said to be that of comprehensive, coordinated, biological study. The outlook of isolated laboratory workers, especially those whose attention is concentrated on highly specialized studies, often

[1] Statement prepared at the suggestion of delegates of the U. S. S. R., at the close of a conference in New York City to consider plans for an All-Union Institute of Experimental Medicine at Leningrad.