over a large area. . . . There is reason to suppose that, even if every territory were to adopt the most modern methods of control and to organize a highly efficient service, they would still be powerless to affect materially either the general development or the extent of a locust outbreak once it has developed on a considerable scale.

It has sometimes been argued that the present locust outbreak is unprecedented in its extent and that it is unlikely that so formidable an attack will occur again. All the available evidence, however, points to the opposite conclusion. . . . It may, therefore, be confidently assumed that far from being less serious, locust invasions in the future, if allowed to develop, will be even more disastrous than that through which we are now passing.

There is nothing to lead us to suppose that the remote districts which serve as the permanent breeding places of locusts are likely to suffer any natural changes which would cause them to cease to produce locusts. Thus, unless the problem can be solved by the effective control of the breeding areas, there is every likelihood that as larger areas come under cultivation in Africa there will be a proportionate increase in the losses sustained by reason of locust invasions. Even in the present outbreak the losses, direct and indirect, have amounted, we estimate, to at least £7,000,000, and this figure may be well greatly exceeded during the next outbreak.

One of the most important of the results so far obtained is the discovery that the distribution, breeding habits and migrations of locusts which formerly appeared so capricious in character are, in fact, subject to definite regularities. Thus it is now known that each species of locust is restricted in its occurrence to a vegetation zone of a definite type. Again, the migrations of swarms from and to the breeding areas are now known to be regulated by seasonal climatic changes. . . .

If, therefore, the permanent breeding places were known and were kept under regular observation, it should require but little expenditure of time or money to control swarms immediately they began to form after the transformation of the locusts from the solitary to the swarming phase. Control of this type, once established, would at last rid Africa of the constantly recurring risk of devastation by locusts. . . . It is in the hope of providing a solution to this problem that we have devised the experiments in the use of aircraft against locusts that are now being carried out in Africa.

THE AMERICAN TREATY ON THE ROERICH PACT

PRESIDENT ROOSEVELT has appointed Secretary of Agriculture Henry A. Wallace as United States plenipotentiary to sign the Inter-American Treaty on the Roerich Pact, for the protection of artistic, scientific, historical and cultural monuments. This treaty has been drawn up by the Pan American Union in accordance with the unanimous resolution of the Pan American Conference at Montevideo recommending that all the American governments adopt the Roerich Pact for the protection of culture.

In regard to this appointment, Secretary Wallace issued the following statement:

I am deeply gratified to have been named by President Roosevelt to sign for the United States this important document in which I have been interested for many years and which I regard as an inevitable step in international relations.

The Roerich Pact, which forms this treaty, provides that all museums, cathedrals, universities, schools, libraries and other cultural sites be registered by the nations and marked by a banner—known as the Banner of Peace —which designates them as neutral territory respected by all signatory nations. This pact owes its conception to the versatile genius of Nicholas Roerich, one of the greatest figures and true leaders of contemporary culture.

In many ways the history of the Roerich Pact is analogous to that of the Red Cross which was accepted only after sixteen years of effort. But, as Roerich has written, "where the Red Cross cared for the sick and physically wounded, the Roerich Pact protects the values of human genius, thus preserving the spiritual health of the nations."

The Roerich Pact represents thirty years of tireless effort on the part of Nicholas Roerich. In 1904 after several archeological expeditions he first presented his project for the preservation from destruction of the irreplaceable historical and cultural sites of the nations. In 1929 after his return to America from his Central Asiatic Expeditions, he formulated his project into the Roerich Pact. Three conventions have been held for its promulgation—two in Belgium and the third last November in Washington, when 35 nations officially participated. Following this, the Pan-American Conference in Montevideo unanimously recommended the Roerich Pact for adoption by the American Governments and on this basis the present treaty has been drawn up for signature by the Pan American Union.

At no time has such an ideal been more needed. While the individual nations are working out their separate economic and national problems, it is also necessary that they recognize their responsibility as part of the community of nations. I am not one to urge visionary substitutes in the place of effective action in a world of hard economic facts. Yet I do say that it is high time for the idealists who make the reality of to-morrow to rally around such a symbol of international cultural unity. It is time that we appeal to that appreciation of beauty, science and education, which runs across all national boundaries to strengthen all that we hold dear in our particular governments and customs.

It is for this reason that I regard the ratification of the Roerich Pact as so significant a step. Its acceptance signifies the approach of a time when those who truly love their own nation will appreciate in addition the unique contribution of other nations and also do reverence to that common spiritual enterprise which draws together in one fellowship all artists, scientists, educators and the truly religious of whatever faith.

I feel that this age owes a great debt to Nicholas Roerich in the creation of this ideal—for such ideals

alone afford reality to our efforts for creating material wealth and working out improved social machinery for its distribution. While we work out these myriad individual problems, we must have a unifying principle to which all our hearts can give supreme allegiance. In this way we can work with faith and anticipation towards those spiritual and cultural realities of which the Roerich Pact is a symbol.

SOIL AND CROP SURVEYS IN THE TENNESSEE VALLEY

A CHECK-UP on the crop-producing possibilities of the soils of the Tennessee Valley has been started with work begun on a soil survey of Jefferson County, near Nashville, Tenn. The work will be carried on by the Tennessee Agricultural Experiment Station and the U. S. Department of Agriculture Soil Survey. In addition to the usual soil survey program, Dr. C. A. Moores, director of the State Experiment Station, and Dr. J. C. McAmis, of the TVA Agricultural Division, have planned to supplement the usual program with a detailed crop survey.

These new soil surveys will be used by the Tennessee Valley Authority in planning land use in agriculture in connection with its general program of development. The crop survey will report the present use of the land and the yields under present methods, and will also include estimates on what the land could yield if it were planted to other crops and managed according to the methods that have proved most profitable and practical in using other soils of the same type in that vicinity. The reports will also include results of practical experience in applying fertilizers to the various soils.

Some eroded lands, for example, will probably be classified as best suited to production of timber, others for seeding to meadow and pasture. Farmers will have the results of practical experience of other farmers with similar land in getting out of the soil the best net results and at the same time conserving the fertility of the soil, and conserving the soil itself against destructive washing.

Dr. Charles E. Kellogg, acting chief of the Federal Soil Survey Division, reports that agronomists of the Tennessee Experiment Station will make a special study of crops in the region and will catalogue the results on the basis of the soil types on which the crops are grown. J. W. Moon, of the Soil Survey staff, has been assigned to assist in the soil mapping and W. E. Hearn, senior soil scientist, who has been surveying soils proposed for development as subsistence homesteads, expected to join him.

THE LEONARD WOOD MEMORIAL FOR THE ERADICATION OF LEPROSY

THE Leonard Wood Memorial for the Eradication of Leprosy announces aid for investigation in its field of interest for the current year as follows: The support of the Memorial Laboratory, completed and equipped last year in the leper colony of Culion, P. I., under the direction of Dr. H. W. Wade has been continued. Additional facilities have been furnished the Eversley Child's Treatment Station and the Cebu Skin Clinic built by the memorial, presented to the Philippine Health Service, supported by the latter and directed by Dr. José Rodriquez. The support of the *International Journal of Leprosy* now in its second year of publication has been continued.

In addition to these early commitments of the memorial certain research grants have been made for the current year on recommendation of its Medical Advisory Board:

To Dr. Charles M. Carpenter, of the University of Rochester, for his study of the effect of radiothermic treatment on leprosy;

To Dr. E. V. Cowdry, of Washington University, St. Louis, for study of the histophysiology of the lesions of leprosy, particularly by the method of micro-incineration;

To Dr. Esmond R. Long, of the Henry Phipps Institute in Philadelphia, for a comparative study of acid-fast bacteria;

To Dr. C. A. Mills, of the University of Cincinnati, for a preliminary survey of the effect of climate on the incidence of leprosy, and,

To Dr. M. H. Soule, of the University of Michigan, for a study of the methods of blood culture in tuberculosis and leprosy.

In addition to these specific items of financial support the officers of the Leonard Wood Memorial are aware of a rapidly growing interest in the age-old but still baffling disease, to the solution of which its efforts are committed. Several self-supporting studies have been carried out or are in progress in which this foundation has been of service in an advisory capacity, or to which its very existence has furnished the initiating impulse.

WORK OF THE ROCKEFELLER FOUNDATION IN THE MEDICAL AND NATURAL SCIENCES

IN the medical sciences The Rockefeller Foundation, during 1933, appropriated $1,173,853. In aid of programs of specific concentration in the fields of psychiatry and public-health teaching appropriations were made to the Johns Hopkins University School of Medicine for research in psychiatry; to University College, London, for work in biophysics and neurophysiology; to Washington University, St. Louis, Missouri, for investigations in nerve physiology, and to the Harvard Medical School and Massachusetts General Hospital for cooperative work in psychiatry. For the development of teaching in