The problem facing governments is how to ease these conditions before Australia becomes an adjunct of India or China. Economic easement in China seems a far more rational solution than merely keeping Chinese out of Australia. If white settlement in Australia is urgent, it is equally urgent to begin the industrialization of China. The balance of ideas and opportunity may thus become a sufficient substitute for the balance of power.

There seems to be a high correlation between prosperity in new lands and migration to them. Historically that prosperity has been in turn dependent upon the power of industrial centers to buy the raw materials of the producers of the newer lands. If the post-war world enters an era of expansion (to supply the losses of war and delayed consumption demands) there seems to be a clear possibility that the former relation of industrial areas to raw material areas may be substantially regained. The act of industrialization of former raw materials areas in itself will augment the relative prosperity of the latter. There is no reason therefore why further settlement and industrialization may not go hand in hand.

### GOALS OF NATIONAL POLICY

As a general working principle the acceptance of a bare subsistence standard for planned pioneer settlement may be condemned as a national policy, whether in Australia or Brazil. But settlers on their own initiative will also be looking for small doors of limited opportunity, not necessarily a gateway to the best the world affords. This may prove true of refugee settlement in particular. For refugees, a higher degree of tolerance of hard conditions has been assumed. Will it work out that way?

A scientific inquiry in each major area proposed for settlement can not stop short of the goal of acceptable livings. Granted that there must be wide tolerance at first on the part of almost all settlers, can an inventory of resources, area by area, assure them diversified production and enlargement of opportunity with endurably brief delay? Since most areas of potential settlement are marginal, can scientific inquiry reduce the risks? One may be sure that vast sums will not be spent in the post-war years upon doles to settlers who are badly located. There is every reason, however, why initial aid should be given to well-placed units who will add to the resources and taxable wealth of the countries of their adoption.

The abundance of unused land strikes every observer, yet it is the scarcity of commercially valuable unused land that intensifies the problem. The scientific study of settlement has become to a large degree a study of unused land. What keeps it out of production? Is the soil deficient? Is the water supply undependable? Are the required cultivation techniques peculiar? What is the natural imbalance that must be corrected by scientific study and treatment? The tsetse fly, natural *vs.* artificial vegetation, extreme price changes and soil erosion are among the examples we have mentioned.

No less important is a study in national psychologies. What is the attitude, country by country, toward the foreigner? What part in the shaping or retention of a recognized national attitude is played by experience with groups already established? Are the examples of Colonia Tovar, Cyrenaica and São Francisco correctly interpreted? What is the peculiar nature of the essential political processes in each country? How do the variant political processes play upon or determine migration policies? What are the specific economic equivalents of migration in industry and trade?

When the answers to these and other questions are given, not in the terms of a single specialty, but in the terms of a social and political mosaic, country by country, the science of settlement will have reached maturity. Sophistication of the investigator plays a part in finding practical answers: he must have that "nice tact of circumstances" which enables him to determine reasonably well what specific groups of men can do, or will do, or may be persuaded to do.

# OBITUARY

## EDWARD FRANKLIN GAINES

DR. EDWARD FRANKLIN GAINES, professor of genetics in agronomy and cerealist in the Agricultural Experiment Station of the State College of Washington, died on August 17 in a hospital after an illness which had confined him to his home for two years and to bed for the past year and a half.

He was born in Avalon, Missouri, on January 12, 1886, and moved with his family to Washington when a small boy. He graduated from the State Normal School at Cheney, Washington, in 1907, obtained his B.S. degree in 1911 and his M.S. degree in 1913 from the State College of Washington, and the Sc.D. degree from Harvard University in 1921.

Dr. Gaines joined the staff of the State College of Washington on July 1, 1911, as instructor in agronomy and assistant cerealist in the Experiment Station. He was advanced to the position of cerealist in 1917 and became professor of genetics in 1930.

Faced with the problem of smut which reached a climax in a large number of separator explosions in 1914, Dr. Gaines and his coworkers embarked upon

a program to develop smut-resistant wheats adapted to Washington conditions. Hybrid 128, developed at the Washington Experiment Station through work begun by Dr. W. J. Spillman, was widely used at the time but was very susceptible to smut. Beginning with Hybrid 128, Gaines led the program of crossing it with smut-resistant varieties and from this came successively Ridit, Albit and Hymar, the latter now the leading winter wheat in eastern Washington. This was but part of the work which led to an international fame for Dr. Gaines. He was the author of numerous scientific articles.

In addition to a busy research program, Dr. Gaines was active in church and civic affairs, in the Boy Scouts and in the Grange. He was a fellow in the American Association for the Advancement of Science and in the American Society of Agronomy and a member of the American Phytopathological Society, American Botanical Society, Northwestern Scientific Association, Alpha Zeta, Phi Kappa Phi, Phi Beta Kappa, Sigma Xi and Alpha Gamma Rho.

LEONARD W. YOUNG
THE STATE COLLEGE OF WASHINGTON

## DEATHS AND MEMORIALS

DR. HARRY BERMAN, associate professor of mineralogy at Harvard University and curator of the Mineralogical Museum, died on August 30 in an air crash of an American Transatlantic plane in Scotland. He was on leave of absence from the university and was in charge of research laboratories and of crystal production for the Reeves Sound Laboratories, Inc., and the Hudson American Corporation, both of New York. At the time of his death he was *en route* for England to supervise work for the Royal Air Force and the United States Army Eighth and Ninth Air Forces.

DR. WALTER L. JENNINGS, until his retirement in 1937 professor of chemistry at the Worcester Polytechnic Institute, died on September 2, in his seventy-eighth year.

DR. JOHN FITCH KING, professor of chemistry and chairman of the department at Williams College, died on August 29. He was in his fiftieth year.

DR. R. BENNETT BEAN, from 1916 to 1941 professor of anatomy at the University of Virginia, died on September 3 at the age of seventy years.

DR. HENRY WILSON STILES, professor of anatomy at Syracuse University, died on September 5 at the age of sixty-nine years.

EDWARD F. BERRY, professor of civil engineering and head of the department at Syracuse University, died in his fifty-fifth year on August 28.

WALTER HARVEY WEED, of Los Angeles, consulting geologist, died on September 5. He was eighty-two years old.

SIR ARTHUR SMITH WOODWARD, from 1901 to 1924 head of the department of geology of the British Museum, died on September 2. He was eighty years old.

IT is reported in *The Times,* London, that the Manchester Literary and Philosophical Society, with which John Dalton, the chemist and physicist, was closely associated throughout his life in Manchester, is commemorating his work on the occasion of the centenary of his death. In addition to a memorial lecture, arranged for the first meeting of its next session, the society hopes to publish a memorial volume, in which it is desired to give the whereabouts of relics of Dalton. Many of those which the society possessed have been destroyed by enemy action.

# SCIENTIFIC EVENTS

## ASTRONOMY IN SOVIET RUSSIA[1]

*Nature* reports that nine of the nineteen Soviet observatories were in territory that was overrun by the Germans and have been destroyed or seriously damaged. Most important of these was the Pulkovo Observatory, near Leningrad, which was completely destroyed by air and artillery bombardment. Most of the equipment and the valuable library of the observatory were removed in time to safer places. The Pulkovo staff has continued astronomical research work at Tashkent, Abastumani and Alma-Ata. Professor Belyavsky, director of the observatory, states that it has been decided that reconstruction is to commence immediately and that the instrumental equipment will be reinstalled at Pulkovo at the earliest possible moment, to make possible the resumption of work in fundamental astronomy. More powerful equipment is to be constructed in the U.S.S.R. or obtained from abroad. The Engelhardt, Nikolaeff and Tashkent Observatories will also carry on fundamental observations.

The *Moscow News* has reported the decisions of an astronomical conference held in Moscow in September last. A great astrophysical observatory is to be established with headquarters at Simferopol in the Crimea. There will be three observing stations, one in the Crimea at an altitude of 2,000 meters, a solar station at an altitude of 3,500 meters, and a station

[1] See article by O. Struve, "Post-war Planning in Russia," SCIENCE, February 4, 1944, p. 100.