gists of the Azerbaijan Branch has completed the compilation of the new Azerbaijan alphabet, based on the Russian lettering, and has reworked the orthographical dictionary.

Besides this the workers in this branch have compiled an Azerbaijano-Russian and Russo-Azerbaijan dictionary, more than 120 printer's signatures in size.

Major work is likewise being done on preparing a catalogue of ancient Armenian MSS—a rare collection of literary monuments of Armenia and neighboring countries.

Considerable work has also been accomplished in putting out text-books in the languages of different nationalities—university and secondary-school textbooks having been published on the history of the peoples of Georgia, Azerbaijan and Armenia.

A five-volume "History of the Armenian People" is at present being prepared under the supervision of Academician A. Manandyan.

The importance of the work accomplished by the branches and bases of the Academy of Sciences of the USSR in 1940 was highly appreciated by the governments of the USSR and of the Union republics, 38 scientific workers of the academy branches having been awarded orders and medals and the title of Merited Scientist being conferred upon some of them, while others were awarded certificates of honor.

The growth and progress of national cadres in the scientific research institutions of the academy branches speaks of the flourishing of science in the national republics of the Soviet Union and of the rapid development of the productive forces in these former backward regions.

OBITUARY

KARL LANDSTEINER

DR. KARL LANDSTEINER, member of the Rockefeller Institute for Medical Research, died on June 26, 1943, after a very brief illness which came upon him in his laboratory at the height of his activity, depriving the world of a great immunologist and, in the broader sense, of a truly great scientist.

Born in Vienna in 1868, Landsteiner grew up in the period of rapid development of the biological sciences. A doctor of medicine at 23, he sensed the importance of organic chemistry and studied with Emil Fischer before turning to research in bacteriology and pathology. Just at this time these fields of investigation were seething with excitement over the successes of antitoxins, the applications of bacterial agglutination and the complexities of hemolysis.

Within ten years, Landsteiner had announced the subtle but incalculably important differences in human bloods, the knowledge of which has saved countless lives, and for which he received the Nobel Prize in Medicine in 1930. He was also the first to transmit poliomyelitis to monkeys, a procedure which made experimental study of the disease possible. Early investigations with Donath on cold agglutinins resulted in the development of a most valuable and frequently used diagnostic test. Still studying blood relationships in 1940, Landsteiner, with Wiener, discovered the so-called *rhesus* factor in blood cells, the great practical importance of which is rapidly becoming evident largely from the work of Levine.

During all Landsteiner's activity in Europe and in the United States he kept pace not only with medicine and the biological sciences, but with the intricacies of rapidly expanding chemical and physical thought as well. Shortly after coming to this country in 1922 he proposed a study of the solubility of pure crystalline oxyhemoglobin of one species in a saturated solution of that of another species as a means of establishing the identity or chemical difference of the two proteins. The idea and its successful execution were the natural outgrowth of his comprehension of a section of Planck's treatise on the "Quantum Theory," which he was reading at that time. This method of studying protein solubilities was later modified and developed by Northrop and his school into one of the most rigid criteria of the purity of proteins.

Landsteiner early in his career realized, as had Ehrlich, the essentially chemical basis of immunity and the chemical nature of the serological reactions by which immune processes are made evident. Years ahead of his time, before the advent of micro-methods and micro-balances, he weighed specific precipitates in the presence and absence of complement, but the equipment available was not sensitive enough to show the significant differences that actually occur.

Aware of the complex structure of the natural protein antigens and the difficulty of tracing the chemical groupings responsible for the serological reactivity and specificity of these substances, although he had made contributions in this direction as well, Landsteiner turned to the effect on specificity of the introduction of known chemical elements and organic groupings, building upon an earlier study by Obermayer and Pick. Using principally the diazo reaction for coupling aromatic amines with proteins to form azo compounds, Landsteiner and his collaborators demonstrated the creation of a new specificity characteristic of the entering group, or hapten, showed the importance of position-isomerism in the entering aromatic groups, and charted the interrelationships of

similarly and differently spaced groupings of all kinds. The discovery that simple substances, chemically related to the hapten, inhibited the specific precipitation of the new antigen and its antibody in proportion to the nearness of relationship to the entering group greatly facilitated the testing of large numbers of substances and made unnecessary the often difficult process of preparing an antigen with each. With this material, he was able to discuss and describe immunological specificity in terms of known chemical groupings of simple structure. Perhaps the most spectacular outcome of this work, and a closer point of contact with the specificity of native proteins, was the demonstration with van der Scheer that the order of amino acids in di-, tri- and tetra-peptides was a major directive influence on the specificity.

Landsteiner's book, "The Specificity of Serological Reactions," not only summarizes these researches but places them in their proper perspective in a broad field in masterly fashion.

Of prime importance, also, has been the long series of investigations carried out by Landsteiner and Chase on skin-sensitivity to simple chemical compounds, a study which laid a scientific basis for new concepts of allergy and its mechanisms. Especially noteworthy was the finding that sensitization results most easily from compounds capable of combining with reactive protein groupings and thus presumably forming new antigens foreign to the organism. And no less important were the final joint studies of these collaborators, as yet unpublished and unfinished, on the transfer of acquired sensitivities of this type.

In the laboratory, Landsteiner was the authoritative and energetic director of research; but outside, in his personal contacts, he was diffident, shy and quiet, though his flashes of genial wit were apt to enliven any conversation in which he took part. When he did address a gathering, he was stimulating, inspiring and brief. He played the piano with a sensitive touch and musicianly understanding, but was as reticent in exhibiting these talents as he was in talking of his work.

Dr. Landsteiner's wife and their son, a surgeon, survive him, but he is mourned as well by a host of friends and scientists who not only revered him for his intellect and attainments, but for his genial accessibility and inspiring counsel, as well.

MICHAEL HEIDELBERGER

C. STUART GAGER

AMATEUR and professional horticulturists and botanists have lost a leader and a friend in the death of Dr. Charles Stuart Gager, director of the Brooklyn Botanic Garden, after a short illness, at Waterville, Maine, on August 9.

Dr. Gager was born in Norwich, N. Y., on December 23, 1872, the son of Charles Carroll Gager and Leora Josephine Darke Gager. He received his A.B. degree from Syracuse University in 1895. The New York State Normal College at Albany conferred degrees of bachelor and master of pedagogy on him in 1897, and he received the Ph.D. degree in botany from Cornell University in 1902. Syracuse University gave him the D.Sc. in 1920, and the New York State Normal College a doctor of pedagogy in 1921. In 1902 he married Bertha Woodward Bagg, and two children, Benjamin Stuart (deceased) and Ruth Prudence (Mrs. Kenneth G. Bucklin) were born.

Beginning as a laboratory assistant at Syracuse University in 1894–95 he became vice-principal of the Ives Seminary at Antwerp, N. Y., in 1895–96; professor of biological sciences and physiography at the New York State Normal College, 1897–1905; director of laboratories at the New York Botanical Garden, 1906–08; and professor of botany at the University of Missouri, 1908–10. In addition he taught for short periods at the Morris High School in New York City, at Cornell University, Rutgers University and New York University. In 1910 he was called to become director of the Brooklyn Botanic Garden, to the development of which he devoted the balance of his life. Starting with an area of waste land he created one of the outstanding institutions of its kind.

His botanical interests were primarily physiological and, while associated with the New York Botanical Garden, he initiated one of the earliest investigations of the effect of radium upon plants. Administrative duties and other demands prevented him from developing what might easily have become a brilliant career in research.

Always generous with his energy and his time he served on many committees and boards of horticultural and botanical organizations. His addresses, freely given on numerous occasions, were carefully prepared and always spiced with humor and some unusual or unique point of view. In spite of his numerous other duties and activities, he found time to publish several books on teaching, botany and genetics, and to act as editor or business manager of important botanical periodicals, including the *American Journal of Botany, Ecology* and *Genetics.*

Among other societies Dr. Gager was a member of Phi Beta Kappa and of Sigma Xi and an honorary member of the Royal Agricultural and Horticultural Society of India, of the Pennsylvania Horticultural Society and of the School Garden Association. He served as president of the Botanical Society of America; of the Torrey Botanical Club, of the National Institute of Social Sciences and of the Twentieth