vide a possible escape from some of the impasses into which the older types of morphological reasoning led us.

Finally, if we ask just what genetics can contribute to an understanding of human phylogeny, the answer for the present must be tentative. Perhaps its greatest contribution is a point of view. Some botanical geneticists claim much for it in their field and write, for example, of such matters as the hybridization and genetics of Pleistocene roses. The cytological picture in man does not encourage the hope that anthropologists can soon parallel the botanists in this field. Frequently "Neanderthaloid" specimens are exhibited or described, and occasionally one meets in the flesh an individual who may show some approach to a preconceived notion of what Neanderthal man was probably like. Rather detailed measurements of a striking example of this sort who appeared a few years ago showed, in spite of his archaic aspect, a decided balance on the side of modern man. Do such cases really have any phylogenetic significance? Before answering this question we must have more information than at present. One naturally asks first if there is evidence of heredity in these "Neanderthaloids." In the case just cited there may have been, for the subject claimed close resemblance to a deceased brother. Granting that such a set of traits does in fact represent an hereditary complex, and one suggestive of Neanderthal man, it would still be hardly justifiable to assume that it implies descent from *Homo neanderthalensis* until the component elements of the complex have been determined and their distribution ascertained. But there is hope, in view of the increasing amount of available Neanderthal material, that enough may be learned about the types and range of variation in this form, as well as in *H. sapiens,* to warrant sound conclusions on the now debatable genetic relationships. Not until more has been done in this direction can opinions be passed with much assurance on a whole range of manifestations which are now rather casually assumed to be "reversions"—or, as the geneticist might prefer to express it, products of a recombination of genes long since dissociated.

CONCLUSION

It would be unwarranted to claim too much for the contribution of genetics to anthropology. Genetics can not solve all the problems; it may give a final answer to none of them, but it does provide a point of view and a methodology which are of fundamental significance, and it furnishes an orientation which brings into relief a fresh and stimulating array of new problems. This revitalizing influence, even more than the immediate direct accretion of fact and method, may in the end prove to have been its greatest contribution. To widen the horizon and provide new problems, or a fresh approach to old ones, is a distinct service to any science.

OBITUARY

EDWARD WIGHT WASHBURN

DR. EDWARD WIGHT WASHBURN, chief of the division of chemistry of the National Bureau of Standards, died suddenly at his home from heart failure on February 6, at the age of 52 years.

Dr. Washburn was born at Beatrice, Nebraska, on May 10, 1881. He attended the University of Nebraska from 1899 to 1901 and graduated from the Massachusetts Institute of Technology in 1905. Here he continued his graduate work and received his doctorate in 1908.

Dr. Washburn's contributions to science include the writing of a text-book on physical chemistry, the editorship of the International Critical Tables, the publication of about 100 scientific papers and the direction and supervision of numerous researches. His professional career may be divided into five stages:

(1) As a graduate student at the Massachusetts Institute of Technology, 1905 to 1908, Washburn applied physico-chemical principles to analytical chemistry in the iodine-arsenious acid reaction, which resulted in the first thermodynamic treatment of the problem of "buffer" solutions, and later led him to a study of indicators. In this same period he made the first accurate measurements of true transference numbers and the relative hydration of ions in aqueous solutions of electrolytes.

(2) At the University of Illinois, 1908 to 1916, as a teacher and professor in physical chemistry, he produced his preeminent work in pure physical chemistry, including the thermodynamic treatment of the colligative properties of aqueous solutions; the development of a "simple system of thermodynamic chemistry" by means of his "perfect thermodynamic engine"; the measurement of Faraday's constant with the iodine coulometer, and the development of a high precision viscosimeter and of apparatus for the precise measurement of the electrical conductivity of aqueous solutions of electrolytes. In 1915 was published the first edition of his widely used text-book on "An Introduction to the Principles of Physical Chemistry." A second edition appeared in 1921, and a French translation was brought out in 1925.

(3) While head of the department of ceramic engineering at the University of Illinois, 1916 to 1922,

Washburn wrote, "Physical chemistry is coming to be not so much a definite branch or field of chemistry as it is an attitude or point of view and method of approach to problems in all branches of chemistry"; and it is not surprising that he applied the principles of physical chemistry and thermodynamics so effectively to this new field of ceramic chemistry. The work which was carried on in his laboratory during this period included the development of precision apparatus and technique for measuring the viscosity, density and surface tension of glasses at high temperatures, as well as studies on dissolved gases in glass and the theory and methods for measuring the porosity of ceramic substances.

(4) From 1922 to 1926, Washburn literally buried himself in the task of editing the International Critical Tables. Science and technology must forever owe a great debt to his perseverance, tenacity and sacrifice in carrying on this monumental undertaking.

(5) In 1926, he assumed the leadership of the division of chemistry at the Bureau of Standards. The beginning of this last period of his career saw his work on the International Critical Tables come to a successful end. Washburn now devoted himself to the application of the principles and methods of physical chemistry to the problems of chemistry and technology, and had leisure meanwhile to satisfy partially the innate scientific curiosity of his imaginative mind. In this period he initiated a program of thermochemical research having for its object the accurate determination of the thermochemical constants of substances important to science and industry; instituted and directed the extensive project of separating, identifying and determining the constituents of petroleum, which involved the development of many and varied types of new apparatus; directed the research on rubber hydrocarbons which resulted in obtaining the first rubber crystals; and found time to make many personal contributions to science, among which may be mentioned his exhaustive study of the "Standard States for Bomb Calorimetry." The crowning achievement of Washburn's scientific career came with his discovery in December, 1931, of the fractional electrolysis of water. This process has made possible the preparation of relatively large amounts of practically pure deuterium, or "heavy" hydrogen of atomic mass 2, and has resulted in the opening up of a new field of research in physics, chemistry and the biological sciences.

Washburn's appointment as chief of the division of chemistry infused new life and activity into the group. Quiet, friendly, yet withal a little reserved, his ability, fairness and dignity at once commanded admiration and respect, which soon ripened into lasting friendship.

Dr. Washburn was a member of the National Academy of Sciences, the American Chemical Society, the American Physical Society, and the American Ceramic Society, and he carried for years a tremendous burden of committee assignments. He served as chairman of the Division of Chemistry and Chemical Technology of the National Research Council, and was American commissioner of the Annual Tables of Physical and Chemical Constants. He was a member of the International Committee on Thermochemistry and chairman of the International Commission on Physico-Chemical Standards. He was on three occasions a delegate to the International Chemical Union, and active in the work of the International Research Council. When a serious illness in 1929 compelled him to relinquish such activities, Washburn did so with deep reluctance and regret.

In 1910, Dr. Washburn married Miss Sophie de Veer, of Boston, who died two years ago. Their four children survive them.

In Dr. Washburn's death, the Bureau of Standards has lost an outstanding member of its staff—a brilliant investigator, cut off in the zenith of his career.

LYMAN J. BRIGGS

RECENT DEATHS

ARTHUR RANUM, professor of mathematics at Cornell University since 1923, died on February 28, in his sixty-fourth year.

DR. JAMES MUNSIE BELL, dean of the School of Applied Science in the University of North Carolina, a member of the faculty for the last twenty-four years, died on March 3 at the age of fifty-three years.

DR. THOMAS CLACHAR BROWN, teacher of geology at the high school at Fitchburg, Massachusetts, died on February 28. He was fifty-one years old.

THOMAS ERIC PEET, professor of Egyptology at the University of Oxford, died on February 22, in his fifty-second year.

SIR VINCENT RAVEN, a past president of the British Institution of Mechanical Engineers and formerly technical adviser to the London and North-Eastern Railway Company, died on February 14 at the age of seventy-five years.

SCIENTIFIC EVENTS

THE WORK OF THE GODMAN FUND

The London Times calls attention to the fact that January 15 was the centenary of the birth of Frederick Du Cane Godman, to whose memory the Godman Exploration Fund was inaugurated in 1920.

Godman and Osbert Salvin, a life-long friend,