may be opened or closed either chemically[14] or biologically by yeast with respectively loss and gain of CO_2, the increased CO_2 pressure function in DAC as compared with biotin utilization, and other evidence at hand, all suggest the interesting possibility that biotin and its vitamers may act, possibly in alternation between avidin-combinable and -uncombinable forms if these are related to urea ring structure, as a *coenzyme of CO_2 transfer*, either in CO_2 utilization or CO_2 production (just as coenzyme I transfers hydrogen, or adenylic acid transfers phosphate). Such a function could underlie its already established role in heterotrophic fermentation, respiration and growth[12,15,16] as well as a possible role in autotrophic CO_2 assimilation, chemosynthetic or photosynthetic.

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OBITUARY

FRANZ BOAS

IN the death of Professor Franz Boas on December 21st at the age of 84 America loses one of its great scientists. To the day of his death he had continued his indefatigible research in ethnology, linguistics and in problems of race and of human growth. The wisdom gained from a long lifetime of scientific research was lodged, during the last years of his life, in a feeble body, but it was not dimmed.

Franz Boas at the time of his death was professor emeritus of anthropology at Columbia University. He was born in Minden, Westphalia, and was educated at the universities of Heidelberg, Bonn and Kiel, where his particular fields of study were physics, geography and mathematics. The subject of his doctoral dissertation presented to the University of Kiel was "The Nature of the Color of Sea Water," and his first act after receiving his degree was typical of the man. He had already arrived at his life-long conviction that for most scientific problems mere examination of the existing data or cunningly devised laboratory experiments are not enough; he saw the necessity of gathering new first-hand material on conditions as they actually exist in human experience. He wanted, in fact, to investigate sea water and ice under winter conditions in the Arctic. There were no scientific funds to send a young man to winter among the Eskimos with his scientific instruments, so he financed himself by arranging with Berlin papers to act as a newspaper correspondent from the Arctic. He set out as a young philosophic materialist accustomed to seek "causes" in the natural environment; as he said much later, he went to the Arctic with "an exaggerated belief in the importance of geographical determinants." He returned with an abiding conviction that if we are ever to understand human behavior we must know as much about the eye that sees as about the object seen. And he had understood once and for all that the eye that sees is not a mere physical organ but a means of perception conditioned by the tradition in which its possessor has been reared.

He turned therefore to the study of culture. After a few years in Germany he returned to America under the auspices of the British Association for the Advancement of Science to study the tribes of the Pacific Coast of Canada. For fifty years he was to continue his intensive work among these tribes, especially among the Kwakiutl. Every detail—linguistic, physical, archeological and cultural—was, it seemed to him, grist for his mill. No student of culture has ever been more tireless. On his first trip he interested himself in the languages, recorded texts in hitherto unwritten tongues, investigated complex forms of social organization and of economics, observed ceremonies and financial exchanges in minute detail. But this seemed to him only a beginning, and in 1897 he interested Morris K. Jesup, then president of the Museum of Natural History, to finance the Jesup North Pacific Expedition in order that archeological, linguistic and cultural investigation might be carried on by a number of investigators both in the New World and in Siberia. Boas directed the work and the resulting publications which he edited are a landmark in the history of the investigation of cultures historically unrelated to Western civilization. Even as late as 1930 he returned to the Kwakiutl for more fieldwork, and in 1937, no longer able to go to them, he brought a Kwakiutl to his home for the winter.

Boas' emphasis on obtaining accurate, detailed knowledge, both intensive and extensive, not only raised the standards of anthropology; it changed its methodology and problems. In phrasing these problems and in insisting that relevant data be used in

[14] Enzymatically, Squibb crude urease added to the growth medium had no effect (except general toxicity at above 100 mg/l) on the yeast growth activity of biotin, tiotin, miotin, DAC or biotin-avidin, each component (vitamer and urease) being varied over a wide range of concentration.

[15] F. E. Allison, S. R. Hoover and D. Burk, SCIENCE, 78: 217, 1933.

[16] P. György, D. B. Melville, D. Burk and V. du Vigneaud, SCIENCE, 91: 243, 1940.

answering them systematically, he was a great pioneer who led the way into new fields of investigation. He found anthropology a collection of wild guesses and a happy hunting ground for the romantic lover of primitive things; he left it a discipline in which theories could be tested and in which he had delimited possibilities from impossibilities.

The first general theoretical problem on which he worked was that of the importance of the diffusion of traits in human culture. It was necessary to show how each culture, however individual, is in reality one local variant of a far more wide-spread form. Ratzel, his teacher, had believed that this was due to direct influence of the geographic environment; orthodox scientific opinion more generally held that this was due to inevitable operations of the human psyche. He had to prove how constant and pervasive cultural borrowing was, not merely of useful inventions but of curious and even hampering ideas. The growth of human cultures, he demonstrated, had to be understood through a knowledge of the spread of inventions and institutions, whether they appear to us rational or irrational. It was the assembled documentation of this truth that led him to oppose the rational reconstructions of cultural evolutionists.

Historical reconstruction, with all its emphasis on diffusion of traits, never seemed to him separable from social processes which had to be studied in the flesh. He wanted to know as much about the revamping of a trait in a borrowing tribe as about the mere fact of borrowing. In his interest in this aspect of culture he wrote, as early as 1896 and 1904, discussions emphasizing the importance of cultural patterning; in his own words, how a tribe "in its setting among neighboring cultures builds up its own fabric." This problem was closely allied to those concerning the working of the culture, "by which I mean the life of the individual as controlled by culture and the effect of the individual upon culture." Though he had spent many years of his life on historical reconstruction, he recognized clearly that even if we could obtain complete knowledge of how a trait or an institution came into being, that knowledge would not help in the solution of these functional problems. Institutions "affect the individual and he affects them only *as they exist today.*" In 1923 he said that "diffusion was won" and that as he saw it, anthropology should spend its energies answering these questions of the interplay of the individual and culture. He sent a generation of students to Samoa, to New Guinea, to Melanesia, to Africa, to South America and to the North American Indian to study the conditions brought to bear upon individuals by the cultural forms under which they lived.

His insistence on phrasing questions so that they could be answered by investigation and upon gathering first-hand material to answer them was of equal importance in his two other chosen fields of research: linguistics and physical anthropology. He is identified in the public mind with his research in race problems. He came to these problems from researches in the influence of environment upon growth, researches which he began while at Clark University, 1888–1892, and which were stimulated by G. Stanley Hall. "When I turned to the consideration of racial problems I was shocked by the formalism of the work." He set himself against the whole methodology of a "racial" heredity. "Heredity acts only in lines of direct descent. There is no unity of descent in any of the existing races." Especially during the last twenty years Boas constantly had on hand researches in race and in problems of growth, for he recognized the seeds of social catastrophe in the doctrines of the racialists and hoped that if their contentions were disproved it would lessen the danger. As late as 1937 he made the journey to Paris to the Congrès International de la Population to emphasize before a gathering largely dominated by Nazi racialists that social conditions are determinative even for those aspects of behavior usually assigned to "race."

His scientific writings were voluminous and are well represented in the volume of selected papers he edited in 1940, "Race, Language and Culture." His least technical volumes are "The Mind of Primitive Man," 1911; "Primitive Art," 1927; "Anthropology and Modern Life," 1928; and his contributions in "General Anthropology," 1938, which he planned and edited.

Boas' own personal researches are inextricably interwoven with work for which he supplied the inspiration, often arranged the financing and contributed counsel and editorial assistance. His work as editor alone would have been sufficient to fill the lifetime of an industrious man. To his classroom teaching also he gave his best. Until recent years most American anthropologists sat under him. As early as 1896 he began teaching physical anthropology and linguistics at Columbia University and in 1899 was made professor of anthropology there. He retired in 1936. Since then he has devoted himself to his researches and to his championing of social and political sanity. He was a great humanitarian and he believed in the social efficacy of the Golden Rule not merely in individual relations but between groups and between nations. He believed in civil liberties. For a man of Boas' integrity these convictions could not end in lip service; they meant to him taking strong positions about national and international affairs, about the

conduct of education and the organization of schools. During the last decade the fact that his motherland was being allowed to run amok in the civilized world touched him nearly and he feared that the democratic nations would never unite against the Nazi plan of world domination. But he saw always that anything that could be done to stop this menace, even war when the world had let slip all other methods, should be a means to the end of Germany's salvation as well as ours.

Boas received many honors. He was made a member of the National Academy of Sciences in 1900. In 1931 he was president of the American Association for the Advancement of Science. He received the Sc.D. from Oxford University and from Columbia and the LL.D. from Clark University. His alma mater, the University of Kiel, solved its dilemma by awarding an honorary M.D. because that at least he did not have. They were fitting honors to a man of Boas' tirelessness, of his integrity, of his sanity. It was not the honors, however, but these special qualities, so pervaded by his great intellectual powers, which made him one of the noblest representatives of his generation.

RUTH BENEDICT
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RECENT DEATHS

DR. HOWARD A. KELLY, since 1919 emeritus professor of gynecology of the Medical School of the Johns Hopkins University, died on January 12. He would have been eighty-five years old on February 20. Mrs. Kelly died six hours later.

DR. CHARLES J. CHAMBERLAIN, since 1921 professor emeritus of botany of the University of Chicago, died on January 5 in his eightieth year.

DR. GEORGE WASHINGTON CRILE, surgeon, director of the research laboratories of the Cleveland Clinic Foundation, died on January 7. He was seventy-eight years old.

DR. AARON J. ROSANOFF, psychiatrist, formerly California state director of institutions, died on January 7, at the age of sixty-four years.

NIKOLA TESLA, the inventor, died on January 7, at the age of eighty-five years.

SCIENTIFIC EVENTS

ASSOCIATION OF UNIVERSITY PROFESSORS AND LECTURERS OF ALLIED COUNTRIES IN GREAT BRITAIN[1]

As the established bodies for intellectual collaboration were obliged to cease their work owing to the war, universities being in many cases closed down in the occupied countries by the invader, scholars, professors and lecturers from all over the world gradually made their way to England, where they now have their headquarters and are living and working in all parts of Great Britain.

This assemblage seemed to present a unique opportunity for men of mutual interests and intellect to come together and form an association. A few professors of different nationalities, headed by Professor Stefan Glaser, of Poland, decided to start an association, the aims of which are the reconstruction of universities in the occupied countries after the war, the development of an academic fraternity between allied university teachers and research workers now in Great Britain, the consideration of all academic problems both during the war and in the post-war period, collaboration with any other bodies which may have similar interests, the examination of problems referred to it by any of the Allied Governments or by any other appropriate official bodies.

The first general meeting was held on May 11, 1942. From the very first there was a great deal of interest and enthusiasm, and an organization was formed under the title of "Association of University Professors and Lecturers of Allied Countries in Great Britain." There are at present 225 members and twelve countries are represented, besides India and the British Dominions.

As the whole subject of post-war reconstruction and education is a long and very complex one, it was furthermore decided to get in touch and collaborate with other associations of similar interests. Contacts were made with the British Association for the Advancement of Science, the British Association of University Teachers and the American University Union. Several neutral countries, which may have representatives as guests, have been approached, and all the vice-chancellors of universities in Great Britain have been informed of the program of work.

Since the association has to deal with different domains and subjects, it was decided to form separate sections in order that members should be able to collaborate on subjects of mutual interest. There are at present twelve such sections:

(1) Contact and collaboration with British scholars, organization of lectures of Allied professors in Great Britain (*Provisional chairman,* Professor P. Vaucher).

(2) Collaboration with other international bodies; international research center in Great Britain; international review of science and learning (*Provisional chairman,* Professor J. Timmermans).

(3) Reconstruction of science and learning in the occupied countries (*Provisional chairman,* Professor S. Glaser).

[1] From *Nature.*