SCIENTIFIC BOOKS

CULTURAL DEVELOPMENT

Race, Language and Culture. By FRANZ BOAS. Pp. xx + 647. 90 illustrations. New York: The Macmillan Company. $5.00.

THESE admirably selected papers, severally published between 1887 and 1939, constitute at once an epitome of Professor Boas's thinking and of the half-century's progress. In his earliest period, we learn, he recognized general laws of cultural development and, specifically, the universal priority of matrilineal descent, which he was one of the first to challenge (pp. 635, 637). Toward the turn of the century, Ehrenreich mingled linguistic with biological considerations in a classification of races (p. 408); Horatio Hale ascribed similarity in speech to similarity of geographical environment (p. 278), and Boas himself had to defend the statistical treatment of variable phenomena (p. 165).

No assortment of essays can produce the cumulative effect of Boas's monographs. But the chapters on "Growth" (p. 103), "Some Traits of the Dakota Language" (p. 226) and "The Relationship System of the Vandau" (p. 384) demonstrate his mastery of the several main divisions of anthropology, his "für die Anthropologie in allen ihren Zweigen so ausgezeichnete und wahrhaft förderliche Tätigkeit," as Waldeyer wrote in 1906.

From the articles on physical anthropology Boas emerges as anything but the arch-environmentalist of superficial critics. An early and appreciative reader of Galton and Pearson (p. 15), he never belittles heredity, pointing out, *e.g.*, that the *milieu* can not explain the differences between types which live under identical conditions (p. 167). The instability described in his study of immigrants is not tantamount to an inheritance of acquired characters, but corresponds to the botanist's "modifications" (p. 36). The cephalic index of American-born individuals differs from their parents', but would the difference persist in subsequent generations if transplanted to the homeland? The point is not whether environment can change an hereditary character, but whether the index is an hereditary constant.

What really divides Boas from biological fundamentalists is his immunity to fashions. That the constitution of an organism limits its plasticity is for him an empirical induction, which does not enthrone absolute permanence as an axiom. Similarly, he was one of the first to establish segregation in mixed marriages (p. 138), but he is still awaiting proof that the Mendelian ratios hold for normal human traits (p. 35). Such discrimination lends to Boas's writing its peculiar flavor. He neither confounds congenital with hereditary features (pp. 37, 47) nor inborn individual with inborn racial differences (p. 10); identical measurements of members of distinct races, he insists, do not efface the distinctness of these individuals as biological samples (p. 180).

The same maturity pervades the treatment of language. Spirits craving bold genealogical syntheses chafe at the restrictions imposed by the principle of strict lexical correspondence. Only by chance, they chide, is historical evidence extant to prove the generally accepted affinity of Armenian with Indo-European; Boas's canons would bar such recognition. But Boas remains unperturbed: if evidence were lacking, we should simply have to forego a conclusion (p. 218).

This Virchowesque restraint, inevitably grating on Haeckelian temperaments, must not be mistaken for an incapacity to grasp resemblances. Boas was the first to indicate the similarities between Tlingit and Athabaskan; but where others forthwith assumed a genetic bond, he demanded further scrutiny (p. 343). Is there not an alternative interpretation? The grammatical features shared by these stocks may result from borrowing rather than from a common ancestry. There is the comparable case of kinship nomenclatures, whose principles of classification are undoubtedly shared by unrelated groups though the vocables for the degrees of kinship remain quite distinct (p. 215f). Moreover, there are problems galore that can be attacked with hope of definitive solution, say, the processes of dialectic differentiation or the varieties of linguistic categories. If specious synthesis is shunned, there is thus a compensatory widening of the intellectual horizon. This is not unimaginative negativism, but that "tätige Skepsis" of Goethe's which so powerfully stirred Thomas H. Huxley.

And in ethnology the attitude that confronts us is still the same as in Boas's philological and anthropometric research. Some have held this a reproach: stressing his initial training in physics, they suggest that his approach to culture is an unsuitably "scientific" one. This is surely a "psychologist's fallacy," for precisely the opposite holds true. When Boas concerns himself with, say, aboriginal art or literature, he never applies incongruous techniques and he explicitly avoids the objectives of mathematical generalization. Thus, this skilled biometrician deprecates the statistical treatment of cultural data; and, granting the reality of correlations obtained by simpler methods, he is rather frugal in indicating them (pp. 254, 257f., 309, 321). As for laws, the supposed physicist masquerading in ethnographer's clothing has progressively turned his back upon them. In 1888 their determination

seems "the greatest aim of our science" (p. 637); in 1896 historical inquiry in different regions with subsequent comparison of the processes of growth in each becomes the indispensable prerequisite to the discovery of laws, hence represents the immediate goal (p. 279); by 1920 the uniqueness of the several cultures is a dominant idea (p. 286); and in 1932 culture appears so complex that any generalizations about it are either truisms or spurious (p. 257f.).

Actually, the difference between the simpler data of physics and the complex phenomena of geography had impressed itself on Boas very early in his career (pp. 639–647). He thus came to distinguish as coordinate and mutually complementary the desire to merge a host of facts in a simple formula and the desire fully to understand a particular phenomenon in its unique individuality. The recurrent warning against identifying cultural features that are not at bottom comparable (pp. 258, 263) illustrates his tendency to apply to ethnography the geographer's rather than the physicist's point of view.

Boas is, indeed, preeminently scientific in his treatment of culture, but merely because here, too, he is concerned solely with ascertaining the truth, not with tickling aesthetic tastes or indulging in unchecked fancies. Hence the persistent coldness to ambitious schemes of historical reconstruction. "We desire to find uncontestable evidence of transmission, not alone the possibility or plausibility of transmission" (p. 459). Hence also his refusal to make common cause with either extremist faction in the perennial dispute over independent evolution versus diffusion; both schools, he contends, proceed from arbitrary assumptions (p. 282). And, precisely as in linguistics, his mind is not cribbed by conventional ruts. He gives to the threadbare theme an original twist by demonstrating convergence as an unsuspected third reality (pp. 263, 275, 299). As for diffusion, to ascertain its occurrence or direction—the task which exhausts most relevant efforts—is merely the first step. We must ask, which traits are borrowed, which are rejected, and why, and what further changes the innovation may stimulate (p. 291). The study of cultural transference thus merges in cultural dynamics. Characteristically, Boas has shifted his position at different periods, stressing real history as a corrective of evolutionary schemes and emphasizing the processes of growth when historical schematism was in retreat (p. 311).

Though Boas has been continuously interested in methodology, he has not elaborated comprehensive treatises on the order of Graebner's or Wilhelm Schmidt's, preferring to expound his standpoint in occasional papers carefully worked out according to the exigencies of the moment. This predilection inevitably leaves lacunae and even sporadic disharmonies. But this is of small moment. Counsels of perfection are cheap; what counts is the concrete practice of science. As Mach says of the founders of physics. "Noch ohne alle Methode, welche ja durch ihre Arbeit erst geschaffen wird, und die ohne Kenntnis ihrer Leistung immer unverstanden bleibt, fassen sie und bezwingen sie ihren Stoff and prägen ihm die begrifflichen Formen auf."

In the anthropological science of his time Boas has been the great exemplar, fearless of authority, relentlessly self-critical, driven by a sacred thirst to ever new Pierian springs, gaining ever deeper insights into the nature of man.

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SPECIAL ARTICLES

RELATIVE OVERGROWTH OF THE CENTRAL NERVOUS SYSTEM IN VITAMIN A DEFICIENCY IN YOUNG RATS[1]

THE EXPLANATION OF THE NEUROLOGICAL LESIONS OCCURING IN THIS DEFICIENCY

THE relation of vitamin A to growth and function of the nervous system has remained unsolved although several laboratories have reported neurological lesions as a consequence of vitamin A deficiency.

We have been unable to produce neurological lesions by vitamin A deficiency in rats after normal growth had occurred up to an age of 10–12 weeks although the epithelial changes characteristic of the deficiency were invariably produced. However, ataxia and paralysis may be regularly produced in young rats if the deficiency is established at a sufficiently early age. Our procedure has been such as to prevent any considerable storage of vitamin A during the first three weeks of life and placing the rats on a completely deficient diet at 21 days of age. Ataxia and paralysis appear at about 50 days of age, shortly before cessation of growth, and are attended by degeneration of the peripheral nerves and of nerve fibers in various tracts of the spinal cord and in the cerebellar peduncles. The pattern of degeneration in the spinal cord is irregular, chiefly of ascending tracts and can not be correlated with our rather meager knowledge of the order of myelination which is wholly post-natal in the rat. The explanation has been found to be a relative overgrowth of the central nervous system resulting in mechanical damage and degeneration of nerve fibers. The earliest and most striking manifes-

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