Professor Willard D. Fisher has been appointed professor of economics and director of the graduate division of business administration.

DR. JOHN C. SHEDD, who for the past year has been dean of Olivet College and for seven years head of the physics department, has entered upon his work as head of the physics department of Occidental College, Los Angeles.

DR. M. C. TANQUARY, zoologist on the Crockerland Arctic Expedition, returned to this country early in the summer and has recently been appointed assistant professor of entomology in the Kansas State Agricultural College. Mr. A. H. Hersh, of Princeton University, has been appointed instructor in zoology to succeed Mr. Ray Allen, who has accepted a position in Cornell University.

THE following laboratory appointments have been made in the laboratories of the University and Bellevue Hospital Medical College: P. V. Prewitt, A.M. (Missouri), instructor in physiology; E. R. Hoskins, Ph.D. (Minnesota), instructor in anatomy, and J. L. Conel, Ph.D. (Illinois), instructor in anatomy.

DR. L. V. HEILBRUN has been appointed to an instructorship in microscopic anatomy in the college of medicine of the University of Illinois. Last year he was associate in zoology at the University of Chicago.

DR. HARLAN L. TRUMBULL, instructor in chemistry in the University of Washington, has been promoted to be assistant professor.

DR. FREDERIC A. BESLEY has been appointed professor of surgery in Northwestern University Medical School and a member of the attending surgical staff at Mercy Hospital.

C. F. BURGER has been appointed instructor in plant pathology in the graduate school of tropical agriculture of the University of California at Riverside, and Alfred Free Swain, formerly of Montana State College and of Stanford University, assistant in entomology there. Ralph Patterson Royce, formerly livestock editor of the *Missouri Farmer*, has been appointed instructor in animal husbandry at the University of California Farm.

DR. JAMES E. BELL, instructor in chemistry in the University of Washington, has been called as associate professor to Throop Institute of Technology, Pasadena, Calif., where he will have charge of the work in inorganic chemistry.

DISCUSSION AND CORRESPONDENCE

DIFFUSION VS. INDEPENDENT ORIGIN: A REJOINDER TO PROFESSOR G. ELLIOT SMITH

IN the "crude sketch of views" published in SCIENCE for August 11, 1916, Professor Elliot Smith attempts to discredit a method in ethnology which he regards as dogmatic and to substitute for it another which he apparently regards as critical. The issue is the time-honored one of diffusion *vs.* independent development in culture.

It seems to the writer that the picture of the *modus operandi* of "most modern ethnologists" drawn in the initial paragraphs of Professor Smith's sketch is an altogether erroneous one. Without doubt the writers of the classical period of English anthropology often abused the concepts of "independent origin" and "psychic unity of mankind." Of them may be mentioned Spencer, Tylor, Lubbock, Frazer, Lang. The concept of the diffusion of culture through historic contact was, however, by no means foreign even to these thinkers, although they may have neglected to make sufficient use of it in their theoretical constructions. Tylor, in particular, was thoroughly conversant with the problems and manifold difficulties involved in the phenomena of cultural diffusion. As to the modern ethnologists, it would be hard indeed to mention one who has not at some time of his career grappled with the problem of diffusion *vs.* independent development, in material culture, art, religion, social customs. Nor is there one who in his interpretative attempts would make use of the concepts of "psychic unity" and "independent origin" to the exclusion of those of "diffusion" and "historic contact."

On the other hand, a school of thinkers has arisen within relatively recent years, who, following in the lead of Ratzel, have, however,

gone much further, and try to elevate the concept of diffusion to a universal interpretative principle of cultural similarities. This school is usually associated with the name of Graebner, while among its other adherents, to a greater or less extent, may be mentioned Foy, Ankermann, Schmidt and, in the most recent period, Rivers. While there may be little in common between the work of these men and that of the classical English anthropologists there is, however, one significant similarity in the method pursued: both schools of thinkers seize upon one of the two possible modes of accounting for cultural similarities and proceed to ruthlessly apply it in all instances. In the one case as in the other, then, the method is dogmatic and uncritical.

Having apparently embraced the articles of the Graebnerian faith, Professor Smith sees nothing in the concepts of "independent development" and "psychic unity" but "childish subterfuges" and even "a fetish no less puerile and unsatisfying than that of an African negro." This curiously detached attitude the professor attempts to justify by appealing to the testimony of history and of psychology. "The teaching of history," he asserts, "is fatal to the idea of inventions being made independently. Originality is one of the rarest manifestations of human faculty." As to psychology, we read:

> Nor does it appear to have struck the orthodox ethnologist [here again some names would be most welcome] that his so-called "psychological" explanation and the meaningless phrase "similarity of the working of the human mind" run counter to all the teachings of modern psychology. For it is the outstanding feature of human instincts that they are extremely generalized and vaguely defined, and not of the precise highly specialized character which modern ethnological speculation attributes to them.

As against Professor Smith's interpretation of the historic record the writer ventures to submit that the testimony of history proves beyond the shadow of a doubt that independent inventions do occur as well as that originality, while rare in its most pronounced forms, is in a more general sense as fundamental a trait of the human mind as is that of the absorption and assimilation of ideas. What, if not originality, may we ask, the accumulation of the "happy thoughts" of individual minds, could account for the constant improvements in technique and the neat adjustment and cooperation of parts to which bear witness the manufactures of uncivilized man, his traps and snares, his tools, weapons, canoes, rafts, houses and knots? And what is true of material culture applies equally to the domain of ideas. Again, if the term invention is given a wide application—as in this instance it should—can there be any doubt whatsoever that numerous and independent inventions have occurred of spirits, taboos and other worlds, of modes of navigation, methods of hunting, fishing, warfare, the making of fire, punishments, ceremonies, myths, social customs, etc. Now, it is a matter of common knowledge that among the things, ideas, processes, thus brought into being, there occur numerous similarities, parallelisms—brief, perhaps, but unmistakable—convergences. When, in referring to these, the modern ethnologist speaks of "psychic unity," he is not therefore guilty of that naïve utilization of the concept of human instincts so confidently ascribed to him by Professor Smith. Again we must urge the professor to name *one* ethnologist who can be shown to have attributed similarities in cultures to the working of "highly-specialized" human instincts. The "psychic unity" is but a substratum, a universal common denominator, without which the similarities referred to above could, of course, not be expected to occur; but the "psychic unity" is manifested no less in the mechanisms of cultural diffusion than it is in those of independent developments. In neither case does "psychic unity" become an explanatory factor. If there is such a thing as explanation in history, then the complete reconstruction of the historic event is the explanation the ethnologist would demand, in the case of diffusion as well as in that of independent development.

The realization of the equal theoretical status of diffusion and independent development presently resolves itself into the percep-

tion of a difference. From the point of view of ethnological technique the two principles can not be treated in an identical way, for whereas diffusion can be demonstrated, independent development does not, in the nature of the case, permit of rigorous proof. The assertion of independent development always involves the negation of diffusion, a negation based on negative evidence, absence of proof of diffusion. Thus, it could always be claimed that at some time somehow diffusion has occurred. Such a claim would be unanswerable. At the same time it is obvious that the above constitutes a methodologically impossible procedure. A relatively small number of cultural similarities—speaking in particular of primitive cultures—can be referred to diffusion by internal evidence. Such is the case when the similarities brought into juxtaposition are so complex and minute that the probability of their independent recurrence approaches or equals zero. But let us repeat, the number of such instances is small, far smaller than generally alleged, far smaller than one might wish. Outside of these cases there lies the tremendous array of cultural similarities which may have arisen through diffusion or by independent development. In all such cases independent development must be assumed until diffusion is proved or, at least, made overwhelmingly probable.

We need not here enter into a discussion of the highly complicated technique demanded of such demonstrations. Professor Smith voices the conviction that the high pre-Columbian civilization in America "was derived from the late New Empire Egyptian civilization, modified by Ethiopian, Mediterranean, West Asiatic, Indian, Indonesian, East Asiatic and Polynesian influences." Professor Smith does not furnish the proof of his contention; it would therefore be premature to pass judgment upon it. But the author forestalls the character of his proof. We read:

> The proof of the reality of this great migration of culture is provided not merely by the identical geographical distribution of a very extensive series of curiously distinctive, and often utterly bizarre, customs and beliefs, the precise dates and circumstances of the origin of which are known in their parent countries; but the fact that these strange ingredients are compounded in a definite and highly complex manner to form an artificial cultural structure, which no theory of independent evolution can possibly explain, because chance played so large a part in building it up in its original home.

It seems from this highly significant and interesting passage that Professor Elliot Smith will base his proof largely on quantitative and qualitative evidence derived from the constitution of the cultural complex itself. The publication of Professor Smith's work, notice of which is given in a footnote, will be awaited with the greatest interest and impatience by his American colleagues; and if his proof withstands the test of their open-minded examination, the critical ethnologist will be the last one to want to lift a stone for the destruction of what would then constitute an invaluable addition to our knowledge of the ancient civilizations of the world.

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SOME OBJECTIONS TO MR. ELLIOT SMITH'S THEORY

TO THE EDITOR OF SCIENCE: In your issue for August 11, 1916, there appeared a very interesting theory as to the origins of the pre-Columbian American civilizations. It is the belief of the writer of that article, Mr. G. Elliot Smith, that the distinguishing characteristics of American cultures (such as pyramidal structures, the use of irrigation canals, the custom of mummifying the dead, etc.) are derived, by means of a "great cultural wave," from the ancient civilization of Egypt. The "cultural wave" is said to have passed from the valley of the Nile into Assyria, thence to India, Korea, Siberia, the Pacific islands and America. The wave is said to have started about B.C. 900.

This theory is important. But there are several serious objections to it:

1. If Mr. Elliot Smith is right in thinking that the American aborigines in Mexico, Peru, etc., used pyramidal structures, numer-