

Further confirmatory data relative to seed transmission has since been obtained from seed which the writer saved from typical "white pickle" cucumbers collected during the season of 1915. Unfortunately a large per cent. of the seed thus obtained was destroyed by mice. From the small amount which remained eleven typical mosaic plants have been obtained. These plants first showed mosaic in the second or third true leaves, and have since produced typical "white pickle" fruits. The plants were started in pots of steam sterilized soil and transplanted to a field which had not previously grown cucumbers. At the time the disease was first observed on these plants no cucurbits were growing nearby and no insects had been seen on the plants. It seems advisable to present these observations as indicating another means of primary dissemination of cucumber mosaic.

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THE CULTURE OF PRE-COLUMBIAN AMERICA

TO THE EDITOR OF SCIENCE: In common doubtless with many of your readers I noted with interest the short sketch by Professor Grafton Elliot Smith of his views regarding the migration of culture to the American continent. I also awaited with some expectation of assurance an unveiled hostility, which has now appeared in your columns of the issue of October 13, under the signature of Dr. Goldenweiser and Mr. Means.

From the nature of circumstances it must be some weeks before my former chief can reply to these gentlemen and I would request, therefore, in the meantime the opportunity to make a few suggestions.

Apart altogether from the confession of Dr. Goldenweiser, it is of course obvious from their arguments that both writers have arisen in opposition and committed themselves in your columns without having informed themselves of Professor Elliot Smith's precise statements and method of handling his mass of accumulated evidence.

From a somewhat misleading footnote in your issue of August 11 it would seem that

"The Significance of the Geographical Distribution of the Practise of Mummification" had as yet to be published. This monograph appeared in the *Memoirs* of the Manchester Literary and Philosophic Society on July 7, 1915, and was published in book form under title "The Migrations of Culture" a few weeks later. But together with the succession of ensuing papers in that journal and in the *John Rylands Bulletin*, this important monograph seems entirely to have escaped the attention of your contributors. That this should be so in the maze of present-day literature is entirely forgivable, but it is amazing that in "awaiting with the greatest interest and impatience" further exposition of Elliot Smith's brilliant work, ethnologists should hasten with such unseemly speed to warn him against encroaching upon a theory which by the assertion of Dr. Goldenweiser himself must forever rest upon the uncertain basis of mere negative evidence, a theory which to some of us in the light of modern exactitude of method seems scarcely defensible.

Dr. Goldenweiser would have us prove every step of the way in the diffusion theory, and rightly so. In the chaos of ethnological observations, many of them afforded by amateur or untrained investigators, and by indifferent methods, too much stress can not be laid upon this. But at the same time are we really to accept for any particular custom the assertion of independent development merely because as yet rigorous proof of diffusion is not forthcoming! Professor Elliot Smith simply contends that we should subject both to the most searching investigation. Contrary to Dr. Goldenweiser's suggestion, it is not loosely claimed that sometime, somehow, diffusion has occurred. Such statements as have been made are accompanied by tangible evidence of their accuracy. The excellent and indisputable researches of Professor G. A. Reisner and Dr. Elliot Smith in Egyptian archeology afford a striking example of the care and vigor with which every shred of evidence is scrutinized. In the work of the two investigators just mentioned on the discovery of the use of copper and the evolution of the rock cut tomb and in

the distribution of these arts the same searching technique is perceptible and the complete reconstruction of the historic event which Dr. Goldenweiser justly demands is already forthcoming. Especially is it to be observed that this is the case in the assertion of independent development in Egypt of both these practises, a proof, the possibility of which Dr. Goldenweiser apparently denies. But indeed if, as on Dr. Goldenweiser's own statement, all the proof that we have is in favor of diffusion, may we not at least with equal right transpose one of his sentences and say, "In all cases diffusion must be assumed until independent development is proved or, at least, made overwhelmingly probable"?

If such striking similarities, parallelisms, convergences in the working of the human mind really do occur, why, in the words of Mr. Means, should there be no such thing as a wheeled vehicle in all pre-Columbian America? Mr. Means's difficulties over wheels and ships are precisely those which the supporters of independent development should hasten to explain. As a matter of fact, as most recently Dr. Rivers has demonstrated, it is the useful art which frequently is lost in the spread of culture. The human mind is not the logically working instrument, leaping at once to full conception of the connection between cause and effect, between possibility and use, which we are invited to assume. In the geographical distribution of culture whatever has been merely useful tends to disappear; whatever is bound to the consciousness of the individual through some link of superstition or religion tends to be retained, though its significance may be misunderstood or indeed even reversed.

It is true, as Mr. Means hints, that so far no comprehensive and detailed analysis has been made of the physical anthropology of the American peoples comparable with that undertaken by Professor Elliot Smith and his associates upon the ancient Egyptians. It is to be hoped that we may be able to make the lack good in time. But the impress left upon the features and the impetus given to the arts and crafts alike of the ancient Egyptians by the immigration of alien peoples leads me to sus-

pect that in the bodies of the pre-Columbian Americans themselves we may ultimately find the corroborative evidence of whence American culture came. It may well be that by this method we shall find the arrows in Dr. Elliot Smith's figure correctly placed. But even if, as in fact Professor Elliot Smith believes, inherent difficulties in the work will prevent physical anthropological studies in America from bearing the conclusive results obtained from similar researches in Egypt, the case for diffusion, contrary to Mr. Means's conception, is not thereby weakened. In the sturdy nature of its composition the culture-complex is amply strong enough to stand by itself and the possibility that some avenues of approach are closed to us does not necessarily prevent our arrival at definite conclusions along those which are plainly open. Critical ethnologists will, I am sure, judge from the facts themselves.

In conclusion, like one of your contributors, I await with impatience a further monograph from Professor Elliot Smith's fascinating and compelling pen; a monograph which I hear from other sources is to be entitled "The Ancient Mariners."

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MOSQUITOES AND MAN AGAIN

WITHOUT continuing the discussion further than the limits of this paper, it seems advisable to state once more the contention made in my paper "Mosquitoes and Man"¹ for Mr. Jennings in his rather elaborate and erudite criticism² of it misses the whole point so completely as to be definitely surprising and almost amusing.

The point was not the "association" of mosquitoes with man, but that the malarial mosquito *followed* man, and while following man is included in the association with man, it is nevertheless a specific point and worthy of some attention.

¹ SCIENCE, June 2, 1916.

² SCIENCE, August 11, 1916.