Carrión, of the department of mycology and dermatology of the school.

THE ninth annual meeting of the American Association of Physical Anthropologists will be held at the University of Pittsburgh in conjunction with the American Association of Anatomists from April 14 to 16.

DISCUSSION

"LODI MAN"

REWRITINGS in the press of the authenticated University of California release on "Lodi Man" have resulted in certain unintended emphases which the present statement is intended to correct. It may be said at the outset that the findings positively established relate to cultural sequence only. Conclusions as to geology, skeletal human type and age are as yet only tentative.

It has long been known that the region of Stockton, Lodi and Galt, and in part north to Sacramento, about the middle of the Great Valley of California, contained some distinctive archeological forms, such as crescentic obsidian blades and decorated clay balls. But interest at first was in typological rather than chronological problems. In 1929 Schenck and Dawson hesitantly distinguished an earlier and a later cultural horizon.[1] From about 1933 on, Sacramento Junior College, under the leadership of President Lillard, excavated in a series of mounds, and in 1936 published a compact report in which the two periods (plus a recent one) were positively separated.[2] though without the itemized grave-by-grave listing of artifacts which would have rendered an independent check possible.

During 1936–37, R. Heizer and A. Krieger were in charge of intermittent explorations of the area for the University of California. Heizer had previously participated in the Sacramento College diggings, while a student there. In the summer and fall of 1937 he headed a group which excavated further, partly with support from Mr. and Mrs. Beverly Blackmer, whose assistance is gratefully acknowledged. President Lillard also generously put at Heizer's disposal the full field notes recorded during several years of work by Sacramento, thus multiplying several fold the data available to the university. An analytic comparison of individual grave finds established the following conclusions:

There were two native cultures in the area. Certain types of artifacts occur only with certain others. A second class of artifact types occur only with one another, not with types of the first class. The second class is occasionally found with Caucasian objects, hence this culture continued into the historic period and must be the later of the two. Most sites contain material of only one of the two cultures, which are therefore mainly mutually exclusive and separate in time. In a few sites both cultures occur, but in separate graves. These two classes of graves differ less in absolute depth or superposition—all the culture-bearing levels are rather shallow—than in the soil in which they were made and with which they were refilled; indurated clay for first-period graves, alluvium for second. First-period burials are normally extended, second-period flexed.

The cultural differences are of three degrees. First, there are fundamental types exclusively peculiar, such as pencil-shaped slate rods in the earlier culture and clay balls and magnesite cylinders in the later. Second, there are types which carry through, such as charmstones, beads of *Olivella,* disks of *Haliotis,* but with a consistent alteration of form or subtype. Third, a minority of artifacts are common to the two cultures. So far as the purely cultural evidence goes, there may accordingly have been a time gap between the two cultures, but need not have been one. It is conceivable that sites with a transitional culture may yet be discovered. The significance of the results lies in the fact of a cultural succession—the second time, only, that such a succession has been fully established in California—the first being the two (or three) horizons independently recognized in the Santa Barbara channel region by David Rogers and Olson. In Heizer's opinion it is the earlier of the two Lodi-Galt or delta cultures which has the greater affinity to the Santa Barbara cultures.

As regards racial type, the present preliminary indications are that skulls from graves of the earlier culture are narrower and of "pseudo-Australoid" or "Palaeo-American" type. However, the indurated clay matrix has prevented intact recovery of many of the earlier skulls. Of those which are measurable, some are in Berkeley, some in Sacramento, some in Washington. They have not been assembled for systematic study and comparison with the later-period skulls. Until this has been done, all findings as to racial type should be regarded as impressionistic and provisional. That two races should eventuate seems likely enough in view of Gifford's having previously separated out a minority "Buena Vista type" from the Indian skulls of the San Joaquin valley.[3]

Another problem is raised by the soil formations involved. This is now being investigated by C. O. Sauer, geographer, and H. Jenny, soil chemist, at

[1] *Univ. Calif. Publ. in Am. Arch. Ethnol.,* 25: 289–413; see especially p. 402.

[2] J. B. Lillard and W. K. Purves, *Sacramento Junior College, Dept. Anthrop. Bull., 1.*

[3] *Univ. Calif. Publ. in Am. Arch. Ethnol.,* 22: 217–390, 1926, especially pp. 246–7.

Berkeley. Their first-inspection impression at the crucial two-culture site was that a relation of formations of the kind there encountered would ordinarily involve a considerable period, possibly of some thousands of years. It is on this indefinite preliminary reaction that the press statements are based that "Lodi man may be" 15,000 years old. He *may* be, in the sense that the required laboratory tests and further field observations have not yet been completed, and the age is therefore as yet unknown. As an anthropologist, I should be surprised if the soil structure compelled belief in the lapse of a very long time, because after all the two cultures are generically similar.

Similarly as to skeletal mineralization, which seems much greater in the early-period bones. It is notorious that this may proceed at highly variable rates. Moreover, no quantitative determinations are yet available. While this is again a highly promising lead, no reliable findings bearing on age have yet been made from degree of mineralization.

The San Francisco Bay shellmounds, fifty to a hundred miles downstream, probably contain a related problem. Some of them undoubtedly go back to a considerable age. While Schenck has shown that some may not be as old as at first estimated—3,000 to 4,000 years—he has not proved that they are all younger. It is also inherently unlikely that culture stood stockstill during the whole period of accumulation of these large middens. While nearly all the more important shellmounds have now been obliterated, a considerable body of objects and data on them has accumulated at the university during the past 35 years. A beginning has recently been made of analyzing these data by the same method as used by Heizer: recurrent associations of finds. While it is probable that culture change on the Bay has been relatively slow, else differences would long since have obtruded themselves, such sequences as there were should however be determinable, and will then presumably correlate with those established for the Stockton-Sacramento and Santa Barbara areas.

Since my name has been brought into the press reports, it is only fair to state that my connection with the work near Lodi has been wholly advisory, and mainly cautionary. I have not even seen what is regarded as the type site. The first pertinent observations were made by Dawson, the first recognition of a possible culture succession by Schenck. Lillard and his associates have assembled much the largest body of exact archeological data. Heizer has been responsible for the most recent investigations and archeological interpretation. The geomorphologists, soil chemists and physical anthropologists are still to be heard from.

A. L. KROEBER

UNIVERSITY OF CALIFORNIA

A NEW DISTURBANCE OF RED PINE

RED or Norway pine (*Pinus resinosa* Ait.) has been regarded as a particularly suitable species for reforestation in the northeastern and lake states. The susceptibility of the more valuable white pine (*Pinus strobus* L.) to tip weevil and blister rust and the relative freedom of red pine from pests have caused the latter species to be given preference in many cases. The investigations now being carried on by the writer upon an unreported disturbance of red pine indicate that its freedom from disease is more apparent than real in many sections of the northeastern United States.

The external symptoms of the disease were first noticed by James A. Brock, assistant superintendent of the Rochester Municipal Watershed, in a plantation of young red pine in Ontario County, N. Y., during the summer of 1933. Since then the writer has found it or had reports of it throughout most of New York State, Connecticut and two counties in southeastern Pennsylvania. In gross aspect the symptoms resemble some types of insect injury, as the most conspicuous external characters are the extra-seasonal growth of one or more lateral buds in the terminal bud-cluster and the subsequent "forking" of the tree. The extra-seasonal growth of the lateral buds begins in June or July of the year that they are set, and may continue through August in the region of Hemlock Lake, N. Y. One or more buds are formed at the tip of these precocious shoots before growth ceases. The terminal bud of the parent shoot seldom takes part in this extra-seasonal growth and usually elongates at the normal time the following year. Since the abnormal or precocious laterals assume a more vertical position than is normal, the subsequent growth of the terminal bud causes a forked appearance of the tree. In some cases the original terminal may be forced to take the position of a lateral. This phenomenon, although undesirable, *per se* might be of no great consequence were it not for the fact that organic union of the wood usually fails to take place between the forked members during the later growth of the tree. Dissection of a tree, in which forking had occurred, ordinarily showed that the forked branch had failed to unite on its upper surface with the bole of the tree. A resinous pocket or fissure, surrounded by discolored wood, usually occurs at these areas of non-union. Such defects afford an ideal environment for many species of fungi, some of which are known to be parasitic.

Representative plots from approximately 800 acres of red pine, ranging in age from 5 to 25 years, have shown forking in 68 to 94 per cent. of the trees. The affected trees seldom, if ever, remain permanently forked, as the more vigorous member of the fork assumes a completely vertical position after a few years' growth and the other member tends to take the position characteristic of a normal branch. Hence the