strength 0.3. The points represented conform to the empirical equation:

$$T_g = \frac{\phi_0 + 0.9}{0.76\ \mathrm{Th}_0 + 0.16}. \quad (5)$$

Similarly, the curves of Fig. 4 may be expressed by the empirical equation:

$$T_c = \frac{\phi_0 + 0.3}{2.66\ \mathrm{Th}_0 + 0.05}. \quad (6)$$

Both equations are useful only at ϕ_0 concentrations above the T minimum in the $\phi_0 - T$ curves. Equations (5) and (6) indicate a similar basis of measurement in the two systems.

The presence of 1.53% acacia (Fig. 1) increases the reaction velocity by about 20%. On the basis of clotting time measurements the "reaction" has been accelerated by a factor of about 1.8, since acacia has decreased the clotting time from 2.5 to 1.4 min. The major portion of the effect, as indicated above, is due to a shift in the distribution of fibrin and potential fibrin. Thus, accelerators or inhibitors might not affect the rate of a reaction appreciably, but might cause large changes in clotting time by altering the distribution between fibrin and potential fibrin, and by changing the absolute value of the former. For this reason, the use of clotting times alone to compare reaction velocities at different pH's and ionic strengths or in the presence of accelerators or inhibitors is open to question.

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Radiocarbon Age Measurements and Fossil Man in Mexico

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The final release of radiocarbon dates obtained by Arnold and Libby (*1*) includes a number of age determinations of plant materials from prehistoric sites in the basin of Mexico that I collected for that purpose. Considering the geographic location of these localities, intermediate between North and South American prehistoric stations, a brief commentary is warranted, with special reference to the geologic antiquity of man in that region. Basic for this problem are the two age measurements (*1*, p. 13, samples No. 204 and No. 205) for two samples, wood and peat, from the Becerra formation, which represents the Upper Pleistocene in that area. The time range indicated is 10,603–20,000 years ago, the latter date referring to results previously communicated to me. It happens that the peat sample was collected by my Mexican collaborator, A. R. V. Arellano, from a geological horizon and level that corresponds in topographic elevation and stratigraphic position with the swamp deposit at Tepexpan where I had found the partly fossilized remains of "Tepexpan Man." At both localities fossil bones of elephant and horse occur, a tooth of the latter having been found in a later excavation 5 yards distant from the original position of the human bones. As the new excavation trench substantiated the impression of an undisturbed occurrence of human remains with fossil elephant, the date for the Becerra peat being 11,-300 ± 500 years ago, my original estimate of 11,000–12,000 years for the human bones appears to be supported by the radiocarbon count.

A special effort was made last year to secure plant samples from the Tepexpan Man site itself, a task which involved the removal of some 4 tons of clay, from which delicate plant roots were extracted. Although it was by no means certain that these roots and stems had not grown from a younger lake floor into deeper and older sediments, such an effort nevertheless promised information on their mode of origin and age. A botanical examination of the roots was made by J. Beal, head of the Botany Department, University of Chicago, who believes that they belonged to an unidentifiable water plant, uncarbonized and in a fresh state of preservation. At the site, single roots were seen to extend 10–12 in. into laminated sandy clay of buff coloring, the roots standing upright and fading out toward the overlying caliche soil (4 in.). The latter showed faint traces of dark root canals that must have extended from the overlying marsh deposit, a sandy marl 15 in. thick, from which fresh-water shells and roots had previously been reported (*2*, p. 38). Considering the nature of the sediment below the caliche, a laminated deposit requiring a slow rate of sedimentation, it is most unlikely that roots could have grown at the same rate as deposition of sediment proceeded. The fresh preservation is obviously due to the sealing effect of the overlying caliche, which prevented bacterial action at a depth of 30–40 in. below the marl. Some modern water plants in the relic Lake Texcoco, in the basin of Mexico, showed roots and stems 10–20 in. long, a length that might well have been exceeded at Tepexpan in view of the water-logged condition of the older swamp deposit below the caliche.

In the light of these considerations, the age measure-

ment (*1*, p. 13, sample No. 421) for the Tepexpan roots, 4,118 ± 300 years, indicates the date for the younger marl above the caliche, not for the bone-bearing layer itself. In other words, paleontologists and prehistorians need not infer from this radiocarbon date that mammoth and horse existed that late in the basin of Mexico; on the contrary, the absence of such fossil remains in formations of Recent geologic age in that area clearly indicates their extinction long before that time.

Considering further that bone and stone artifacts have been found by me and others in the Becerra formation near Tequixquiac, on the northwestern margin of the basin of Mexico (*2*, pp. 46–49), human antiquity can in the light of these new radiocarbon dates be accepted as proved. In this respect, the age measurement of 6,390 ± 300 years for charcoal taken from a preceramic culture-level at Tlatilco affords a significant glimpse into Mexican prehistory, for it establishes an age of early human occupation that antedates the first appearance of organized farming societies of the Archaic civilization by about 3,000 years.

In all these studies much valuable cooperation was given me by my Mexican colleagues, notably Daniel F. R. de la Borbolla, Alfonso Caso, Engineer Arellano, and Arturo Romano. A monograph on the basin of Mexico, as well as a travel book of mine, will soon be published.

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Lipase from Molds Grown on Oil Seeds

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Camus (*1*), Garnier (*2*), and Wehmer (*3*) detected the presence of the enzyme lipase in molds like *Penicillium* and *Aspergillus* species. Ramakrishnan and Banerjee (*4*) found that the enzyme lipase obtained from the molds grown on oil seeds has a better activity than that obtained from the oil seeds.

In India, which stands second in the production of oil seeds, owing to improper storage and transport, millions of tons of oil seeds are spoiled every year because of mold growth. The authors have therefore undertaken a detailed study to analyze the different molds grown on different oil seeds, prepare the pure strains of the lipolytic molds from them, grow them in a synthetic medium, extract the lipase, and study its activity on various oils and fats.

In general the optimum pH for the lipases obtained from molds is 6.2. Disodium phosphate-citric acid is the best buffer, and ground-nut oil the best substrate.

Our preliminary survey has indicated that a cake medium is the best and cheapest for the production of lipolytic molds on a large scale. Work is under way to collect the strains of all the lipolytic molds, construct a pilot plant to grow them on a large scale, and extract lipase from them in a pure form.

Details of the results will be published elsewhere.

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In Vivo Transformation of D,l-3-Hydroxykynurenine in Xanthurenic Acid

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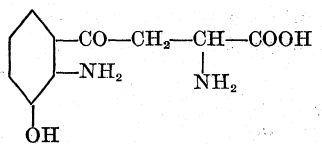
Musajo, Spada, and Casini (*1*) have recently accomplished the synthesis of D,l-3-hydroxykynurenine (small, citron-yellow crystals, mp 213° C, with decomposition):



This synthesis differs slightly from what appeared in a paper by Butenandt, Weidel, and Schlossberger (*2*) published shortly before the work of Musajo and collaborators; the German authors also mention the isolation of l-3-hydroxykynurenine from the fractionation of fresh chrysalids of *Calliphora erythrocefala.*

Musajo, Spada, and Casini have also shown (*1*) how 3-hydroxykynurenine can be transformed *in vitro* by heating with barium hydroxid in xanthurenic acid (4,8-dihydroxyquinoline-2-carboxylic acid) (*3*) and in 3-hydroxy-2-amino-acetophenone. From this transformation of 3-hydroxykynurenine we obtained about 30% by weight of xanthurenic acid.

Musajo and Chiancone determined in 1936 (*4*) that xanthurenic acid is formed *in vivo* from tryptophan through kynurenine. Later, in 1942, in the United States, Lepkovsky and Nielsen (*5*) brought to light the influence of vitamin B_6 on its formation.

Proceeding with our research on the genesis of xanthurenic acid, we treated rats with D,l-3-hydroxykynurenine and determined the xanthurenic acid eliminated with the urine. Parallel comparison experiments were also carried out with D,l-kynurenine. The animals were first held on a synthetic diet of casein, starch, fats, salts, and vitamins, and later gelatin was substituted for casein. From the urine of these animals, where xanthurenic acid was absent, after treating them