such as the coronary circulation, which normally extracts oxygen at low oxygen tensions. An amount of carboxyhemoglobin of 5- to 10-percent saturation, which could occur in heavy smokers, could lead during exercise to severe myocardial hypoxia in patients with coronary-artery disease. Myocardial oxygen is limited by flow, in that increased requirements of oxygen are normally met by increase in coronary flow rather than in the amount of oxygen extracted. Diseased coronary arteries cannot significantly increase flow, and hypoxia can be prevented only by increased extraction. Thus even small amounts of carboxyhemoglobin may hinder unloading of oxygen and produce hypoxia in tissue.

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13 May 1965

Pox Pottery: Earliest Identified Mexican Ceramic

Abstract. *The earliest known ceramics from Mexico, termed "Pox Pottery," may mark the transition from a nomadic to a settled way of life. The presence of "Pox Pottery" in both coastal Guerrero and the Tehuacan Valley might provide evidence as to the type of environment in which this change first occurred.*

During the spring of 1960, my wife and I excavated two pits along the Guerrero coast at Puerto Marquez and Zanja, and found samples of the earliest ceramics yet uncovered in Mexico.

Puerto Marquez Bay is immediately to the south of Acapulco, and the modern village of Puerto Marquez is situated at the center of the bay on a narrow bar which separates the Pacific from mangrove swamp. The southern side of the bay is formed by a short mountainous peninsula rising from these swamps. It is possible to travel by canoe from the town of Puerto Marquez through the mangroves behind this peninsula to a sand bar fronting on open ocean. The archeological site is next to a fresh-water stream on a northward-facing cove of this promontory and consists of a poorly defined mound stretching back from the beach. Much of the site is now covered by the residence of Ing. Adolfo Orive Alba.

Zanja is located on a narrow branch of a large lagoon about 8 km to the southeast of Puerto Marquez and 5 km inland from the Pacific. Part of the single, low mound forming this site has been eroded by the lagoon so that quantities of potsherds and shells extending downward below the water can be seen. The site is distinguished from the immediately surrounding swamp and essentially barren sandy patches by the lush grove of coconut palms it supports. Today there are no permanent habitations on the mound, although temporary camps are frequently established there by people wanting to exploit the resources of the lagoon. Flooding forced us to abandon our excavation at Zanja after we had reached a depth of 4.60 m but before we had reached sterile soil.

At Puerto Marquez, Ing. Orive kindly granted us permission to dig a pit behind his house. No obvious stratification was present, so we excavated arbitrary layers, each 20 cm thick. The layers were numbered from top down until sterile soil was reached after 7.60 m at layer 38. The first 33 layers of refuse contained abundant pottery. The deepest meter (layers 34 to 38) produced no potsherds, and the cultural inventory was confined to little chunks of obsidian, some retouched flint flakes, and a single small flint core. When the age of material from the bottom of the pit (layer 38) was determined by carbon-14 dating techniques (*1*), a date of 2940 ± 130 B.C. was obtained; material from layer 33, the first ceramic-bearing layer, gave a date of 2440 ± 140 B.C. These tests indicate that the area was occupied for 500 years before pottery was manufactured. Starting with layer 29, sherds carrying distinct resemblances to ceramics from the earliest known Formative cultures were encountered (*2*). Below layer 29, many of the sherds were dissimilar to any ceramics from Mexico for which descriptions have been published. Fragments essentially identical to these were recovered from the deepest levels at Zanja. I have termed these sherds "Pox Pottery."

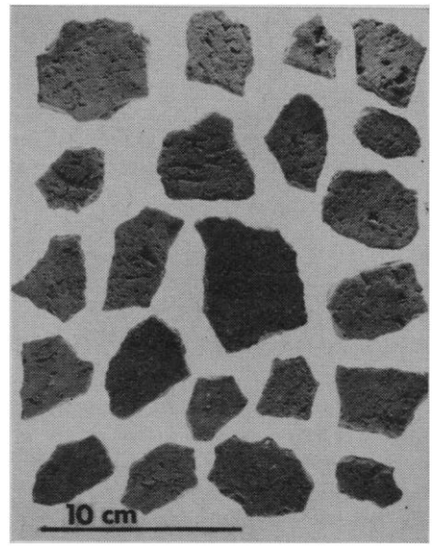

Fig. 1. Examples of Pox Pottery sherds from Guerrero, showing concave surfaces.

The diagnostic feature of Pox Pottery is the rough and pitted appearance of the inside or concave surface of the sherd (Fig. 1). The pitting was undoubtedly produced by roughly brushing or wiping the interior of the vessel after the clay had dried sufficiently to have lost most of its plasticity. This caused the irregularly sized particles of temper to be dragged along and away from the clay, leaving numerous deep gouges and crater-like indentations. This crude interior contrasts with the well-smoothed, occasionally red-slipped exterior or convex surface of these fragments. Pox Pottery is quite friable, and the generally small sizes of the sherds make shape determinations difficult. Where these could be made, the forms were either sharply incurving neckless pots or vessels with high straight necks. Similar shapes occur during the succeeding period at Puerto Marquez and Zanja, at other early Formative sites in Mesoamerica (*2*), and among the earliest ceramics from Tehuacan (*3*).

The most ancient pottery heretofore reported from Mexico comes from Tehuacan. I have examined some of this material and have found that the pitted interiors and well-smoothed exteriors of the sherds are conspicuously similar to the Pox Pottery from Guerrero, a resemblance that has been commented on by others (*4*). The Tehuacan Pox Pottery occurs during the Purron phase which commenced in 2300 B.C., according to carbon-14 determinations (*5*). This date exactly equals the upper limit provided by the single carbon-14 determination available for the Guerrero Pox Pottery. Although this may indicate that the Guerrero ceramic antedates its Tehuacan counterpart, any claim to priority based on a single carbon-14 test has to be viewed with considerable skepticism. However, as both the Pox Pottery of Tehuacan and that of Guerrero were probably produced for a number of centuries, they must have been contemporaneous for part of the period during which each was made. The several hundred kilometers of rugged, mountainous terrain that separate these points of manufacture provide evidence for the existence of an extremely ancient horizon of closely interrelated cultures.

At both Tehuacan (*3*) and Guerrero, Pox Pottery overlies sherd-free cultural debris, making it highly probable that it constituted a portion of the first pottery made in both areas. As the fragile nature of ceramic containers make them of little use to nomadic peoples, the presence of pottery at an archeological site can imply a settled mode of subsistence. Consequently, Pox Pottery could prove an important horizon marker for the terminal stage in the change from a nomadic to a sedentary way of life. Additional examples of this pottery may be expected to turn up as more sites bridging this period of transition are discovered and excavated.

Coastal Guerrero and the arid Tehuacan Valley provide man with vastly different environments. The presence of Pox Pottery in such diverse regions might elucidate problems concerning the type of environment in which settled life first became established. Coe and Flannery (*6*) have advanced the hypothesis that this change took place at sites occupying lagoon- or estuary-dominated environments such as that enjoyed by Puerto Marquez and Zanja. Any evidence supporting the priority of the Guerrero over the Tehuacan Pox Pottery would lend credence to this hypothesis.

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Glutamic-Oxaloacetic Transaminases in Reticulocytes and Erythrocytes

Abstract. *In rabbits, mature erythrocytes contain only the anionic isozyme of glutamic-oxaloacetic transaminase. Reticulocytosis induced by massive bleeding or by treatment with acetylphenylhydrazine is characterized by a five- to sixfold increase in red-cell transaminase and the appearance of a cationic transaminase isozyme that apparently resides in the mitochondrial fraction of reticulocytes.*

The anionic and cationic isozymes of glutamic-oxaloacetic transaminase (GOT) of human and animal heart and liver have been investigated in some detail (*1, 2*). Mature erythrocytes of man contain only anionic GOT; the kinetic and immunochemical characteristics of this component have been reported (*3*). The present communication is concerned with the electrophoretic characteristics of GOT in rabbit erythrocytes and reticulocytes.

The hematocrit, hemoglobin, reticulocyte content, activity of red-blood-cell transaminase, and the electrophoretic pattern of red-cell GOT were determined in each of two rabbits during a 5-day control period. Each rabbit was then injected subcutaneously with 1.0 ml of a 2.5-percent solution of acetylphenylhydrazine hydrochloride in 47.5 percent ethanol (*4*) on each of 5 successive days. Similar determinations were made throughout this period and during a subsequent recovery period of 2 weeks. The GOT activity of appropriate dilutions of hemolyzates were determined by the method of Karmen (*5*). The units of activity were expressed, however, per milliliter of hemolyzate per milliliter of reaction mixture.

The electrophoretic characteristics of GOT in hemolyzates of human red cells were examined in starch gels made up in 5.0 m*M* succinate-tris buffer, *p*H 7.2. The final *p*H of the gels was 6.8 to 7.0. Electrode vessels contained 0.1*M* phosphate buffer, *p*H 7.2. Electrophoresis was carried out in a cold room (4° to 6°C) for 18 hours at 4.0 volt/cm and 9 to 13 ma. The gels were sliced and stained specifically for GOT by the method of Schwartz *et al.* (*6*) (Fig. 1). As the reticulocyte counts rose, the GOT activity of the red blood cells increased about five- to sixfold, and a cationic zone of GOT appeared on gel electrophoresis. The appearance of the cationic band paralleled the fall in hematocrit and the rise in reticulocytes. There is also some indication from Fig. 1 that the intensity of the anionic band was inversely related to the intensity of the cationic band. Similar, though less marked, results were obtained when two rabbits were subjected to five successive bleedings, 25 to 30 ml each, over a period of 8 days. These results were not related to the possible presence of white cells since none were detectable per 1000 red cells through the 8th day of the experiment. The white-cell counts on days 9 and 12 were 0.1 percent and 0.5 percent, respectively, and decreased again to zero for the remainder of the observation period. Leukocytes have about the same transaminase activity as reticulocytes (*7*).

The intracellular distribution of