LINE DRAWINGS FROM UNSATISFACTORY PHOTOGRAPHS

Conventional methods of making line drawings from photographs not suitable for reproduction consist, in general, of inking in desired features on a large print of the photograph, usually blue, and then bleaching out the photographic image. This procedure, which gives good results in skilled hands, produces a line image consisting only of the applied ink lines, which are usually somewhat degraded because the paper fibers are displaced ("exploded") by the chemical action of the bleaching solution. This same chemical action makes difficult additional ink work after bleaching.[1]

High-contrast films developed during the last decade make possible several simplifications of this procedure. When the ink work on a blueprint is satisfactory (as determined by viewing through a deep blue filter), the print, as is, may be sent to the engraver, with instructions to "drop out the blue," which he does by using a high contrast "color blind" emulsion, such as Kodalith.

Where many prints are desired, the inked blueprint may be copied on "color blind" film, or panchromatic film with blue lighting or a blue filter. When properly copied, prints from the resulting negative will include only the ink lines added to the blueprint.

When a fine paper surface is necessary for proper inking, the desired image may be printed on a suitable photographic paper, the resultant image toned a convenient color, such as red or blue, by any convenient process, and the ink work added. The background image is then dropped out by use of panchromatic film and a filter of the same color as the unwanted image.

This procedure is superior to the older bleaching process because the quality of the inked lines is not altered by the chemical and mechanical disturbances of the paper structure caused by the bleaching process.

RONALD L. IVES
Department of Geography
Indiana University
Bloomington, Indiana
October, 1947

AN ASTRONOMICAL TEST OF CASO'S CORRELATION

"La Correlación de los Años Azteca y Cristiano" by Alfonso Caso, *Revista Mexicana de Estudios Antropologicos*, Vol. 3, pp. 11–45, Mexico, 1939, may be tested by means of some astronomical data. For this purpose, sources are supplied.

Paul Radin, "The Sources and Authenticity of the History of the Ancient Mexicans," *University of California Publications in American Archeology and Ethnology*, Vol. 17, No. 1, Berkeley, 1920 (Codex Telleriano-Remensis, Part 4, pp. 45–50):

P. 46, Pl. 5, "In the year 12 *rabbit* (1426 A.D.) . . . there was an eclipse of the earth(?)."

P. 47, Pl. 15, "In the year 10 *flint* (1476 A.D.) . . . there was an eclipse of the sun."

P. 48, Pl. 22, "In the year 4 *knife* (1496 A.D.) . . . there was a great eclipse of the sun."

T. von Oppolzer, "Canon der Finsternisse," Vol. 52, Vienna, 1887, provides the following data:

6269	1426	X 30	2242207	18^h	30.1^m
6380	1477	II 13	2260576	19	32.7
6423	1496	VIII 8	2267692	20	39.0

Based on tables of Paul V. Neugebauer, in *Astronomische Chronologie*, Vol. 2., Leipzig, 1929, the local time and the magnitude of the eclipses for Mexico City, or Tenochtitlan, at 99° 7′ W. Long., 19° 26′ N. Lat., are computed.

1426	X 30	11.52 a.m.	0.78
1477	II 13	1.56 p.m.	0.89
1496	VIII 8	3.08 p.m.	Total

In order to check Caso's correlation with the solar eclipse of February 13, 1477, some dates are adapted to his system of equation.

2 Quiahuitl	1 Izcalli	1476	II	5	(year began)
10 Tecpatl	20 Tititl	1477	I	29	(10 Tecpatl)
3 Cuetzpalin	1 Izcalli	1477	II	4	(year began)
11 Calli	20 Tititl	1478	I	29	(11 Calli)

According to this method of correlation, the annular eclipse of February 13, 1477, that approximated nine-tenth totality at Tenochtitlan, fell not in the Codex year 10 Tecpatl (*flint*) but in Caso's year 11 Calli.

R. B. WEITZEL
Washington, D. C.
October, 1947

A WEST INDIAN AX FROM FLORIDA*

A stone ax of West Indian type is included among the collections from north Florida in the Florida State Museum (cat. no. 3535). In view of the ever-interesting question of Antillean-Floridian relationships, this specimen seems worth considering in some detail.

Information in the Florida State Museum catalog indicates that the ax was received in 1914 from A. W. Sargent of Gainesville who found it on the surface near Newnan's Lake, Alachua County. This is about five miles east of Gainesville. It was accompanied by the base of a spearhead, an arrowhead, and a sherd of St. Johns Check Stamped pottery (cat. nos. 3536–3538).

The ax has a roughly rectangular blade; shallow, grooved neck; and broad butt, with a large ear-like projection on either side of the butt and a pair of smaller ones on top (Fig. 55). In cross section, one side is strongly convex and the other partially flattened, so that the artifact might more properly be called an "adze." Its length is 15.8 cm. and its width 10.9 cm.

The material is "a heavy, basic igneous rock, an olivine dolerite of specific gravity 3.03."[1] This is not distinctive

[1] John L. Ridgway, *Scientific Illustration*, Palo Alto: Stanford University, 1937, pp. 62–4.

* This note is published in connection with the Florida research of the Yale Caribbean Program. Thanks are due to Nile C. Schaffer, Acting Director, Florida State Museum, for his generous cooperation.

[1] Identification by Professor Adolph Knopf, Department of Geology, Yale University.

enough to determine its provenience. Similar material is known from the West Indies, but it might instead have been derived from the Late Triassic traprock in North Carolina.

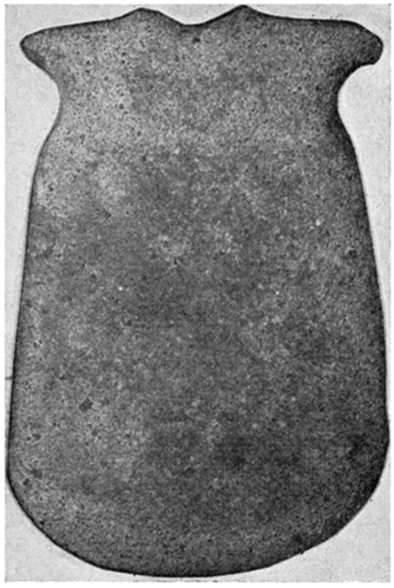

FIG. 55

That the artifact is West Indian in type, however, cannot be doubted. It is of the "eared" type, characteristic of the islands.[2] So far as the writers are aware, nothing like it has previously been reported from the North American mainland, although somewhat similar forms are common in northeastern South America.[3]

The West Indian eared axes used to be called "Carib" after the historic Indian occupants of the Lesser Antilles, where they occur in greatest concentration. It is now known that they were made by the Arawak, whom the Carib replaced in the Lesser Antilles only a generation or so before the arrival of Columbus.[4]

While eared axes have been found throughout the Greater Antilles as far west as Cuba,[5] their number is not great enough to establish that they were made there, nor small enough to indicate for sure that they were obtained by trade from the Lesser Antilles. Surprisingly, they occur both in Arawak sites, as in the Lesser Antilles, and in middens of the Ciboney Indians, who are supposed to have preceded the Arawak in the Greater Antilles, surviving alongside them only in out-of-the-way places.[6]

Evidence concerning the age of the eared axes has been obtained only in Puerto Rico, where they were excavated in stratigraphic units dating from Periods II and III of a four-period sequence.[7] Period III is estimated to have lasted from 1200–1450 A.D.

The two flint points and potsherd found with the Florida ax are local in type. The sherd, with its check-stamping, is a late form characteristic of the St. Johns II period from 1200 to 1700 A.D.,[8] a date which agrees well with that of the eared type of ax in the Antilles.

Further data on the Florida find seeming desirable, Nile C. Schaffer, Acting Director of the Florida State Museum, was asked to check its provenience. He was able to interview its finder, Mr. Sargent, who, although now elderly, remembered clearly the details of its discovery. Mr. Sargent said that he had found the ax, points, and sherd in a plowed field containing no particular concentration of refuse, about 30 feet from the edge of Prairie Creek and 100 yards below Newnan's Lake. He stated definitely that the specimens were not in a mound, although he was aware that there are "mounds" in the vicinity.

During the summer of 1947, the senior author visited the region with W. W. Ehrmann and Floyd Newman of the University of Florida. We investigated the only nearby refuse deposit, Prairie Creek Midden, which is about 50 yards north of the place where the ax is said to have been found, making a small collection of sherds to supplement those from the midden and its vicinity already contained in the Florida State Museum. Since it is probable that the former occupants of this area may have possessed the ax, it will be discussed briefly.

Prairie Creek Midden is about 100 yards east of Prairie Creek, north of state road no. 20, and just south of Newnan's Lake. It measures approximately 100 feet from north to south and 75 feet east–west. The deposit, consisting of sherds, flint chips, and other refuse in a black soil matrix, varies from 2 to 3 feet in depth and rests on white sand. Amateur diggers have badly pitted the site. A low cypress swamp lies between the midden and the creek, but the land rises to the east and south, where the ax is said to have been found.

Analysis of the collections from the midden and vicinity indicates that the area has been long and intensely occupied.[9] This was to be expected in view of the favorable ecological position at the outlet of the lake.

[2] J. Walter Fewkes, "A Prehistoric Island Culture Area of America," *Annual Report, Bureau of American Ethnology*, No. 34, Washington, 1924, pp. 108–9, Pls. 30–2; Sven Lovén, *Origins of the Tainan Culture, West Indies*, Göteborg, 1935, pp. 171–210.

[3] E.g., Henry and Paule Reichlen, "Contribution a l'archéologie de la Guayane Française," *Journal de la Société des Américanistes*, N.S., Vol. 35, Paris, 1947, pp. 21–4, Fig. 4.

[4] Fewkes, *op. cit.*, p. 267.

[5] M. R. Harrington, "Cuba before Columbus," *Indian Notes and Monographs, Museum of the American Indian, Heye Foundation*, New York, 1921, Vol. 1, Fig. 27, p. 118.

[6] Irving Rouse, "West Indies," in "Handbook of South American Indians," Vol. 4, *Bulletin, Bureau of American Ethnology*, No. 143 (in press).

[7] Irving Rouse, "Porto Rican Prehistory," *New York Academy of Sciences, Scientific Survey of Porto Rico and the Virgin Islands*, Vol. 35, Nos. 3–4 (in press).

[8] John M. Goggin, "A Preliminary Definition of Archaeological Areas and Periods in Florida," AMERICAN ANTIQUITY, Vol. 13, No. 2, pp. 114–27, 1947.

[9] The material in the Florida State Museum includes a series of accessions, all apparently from this immediate vicinity (i.e., along Prairie Creek just south of the lake). These include (accession number given): "Prairie Creek Mound" 293, 3635, 3637), "vicinity of Prairie Creek Mound" (231, 320, 336, 358, 406, 451, 473, 492, 499, 546, 596, 603, 628), "six miles southeast of Gainesville" (85, 93), "Vidal Farm" (84), and "along the A.C.L. tracks south of Newnan's Lake" (17). The Yale collections are all from the midden itself.

A total of 567 sherds have been classified. The types are too numerous to list here, as they include almost all of the regional forms as well as trade specimens from other areas. The whole temporal range of ceramic development in Florida is represented. From the earliest period, Orange, come the Orange Plain type, Orange Incised, and St. John's Incised, as well as a single Stallings Island Punctated sherd, native to the Georgia coast. A series of a simple and linear stamped gritty-ware sherds probably falls within the next time horizon, St. Johns Ia, equivalent to Deptford and Santa Rosa-Swift Creek on the Gulf Coast. The Weeden Island culture is represented by ten types. Some of these may date from as early as St. Johns Ib; a subsequent occupation of the area during St. Johns II times is clearly shown by the presence of the diagnostic St. Johns Check Stamped and Wakulla Check Stamped forms. Local types of the latter period include Gainesville Linear Punctated, Alachua Cob Marked, and Prairie Cord Marked. Very late diagnostic trade types are rare, including only two questionable Fort Walton sherds. Numerous unclassified incised and punctated gritty and chalky ware sherds cannot be placed.[10]

A breakdown of the material from the midden and from its vicinity shows little basic difference between the two groups, although the latter includes both more specimens and more types than the former. Nevertheless, the range of specimens is the same in both cases.

Assuming that the stone ax and its accompanying specimens belong with the rest of the material from the midden and vicinity, we are unable to come to any conclusion concerning its age. This immediate area seems to have been occupied from the earliest pottery-making times until the most recent protohistoric period. The ax could have been associated with any culture present during this range.

Since the ax is not only the first of its kind to be reported from Florida but also the only clean-cut example of a West Indian specimen from the Southeast, it is necessary to consider carefully the possibility of a mix-up in provenience. Mr. Sargent, when queried, was certain that the ax was the one he had found in the Prairie Creek locality. He appears to be entirely reliable. Except for the ax, he has collected only a few sherds and points, picking them all up himself in the vicinity of his home. Neither he nor any of his close associates has been to the West Indies. His recollection of the circumstances of the find are convincing.

It is not likely, either, that the ax was miscatalogued after its arrival in the Florida State Museum. The Museum is almost entirely limited to specimens from the state of Florida and lacks West Indian material.

The possibility that the ax was recently deposited where found must also be considered. Although information concerning the exact locality is incomplete, there are no data to suggest deposition later than the accompanying sherd and other specimens found in the vicinity. The absence of any traces of historic occupation is perhaps significant in this connection.

We conclude, therefore, that the ax was probably deposited by the Florida Indians during prehistoric times. If so, it must be a trade object from the West Indies—the first such to be reported for the southeastern United States.

JOHN M. GOGGIN
IRVING ROUSE
Department of Anthropology
Yale Peabody Museum
New Haven, Conn.
November, 1947

[10] For a discussion of the above types and periods, see Goggin, *op. cit.*

THE CULTURAL CONTEXT OF THE CRYSTAL RIVER NEGATIVE-PAINTED STYLE*

In 1944, the present writer, in collaboration with Philip Phillips, published a short analytical article upon a newly discovered (or recognized) style of negative-painted pottery from Crystal River, Florida.[1] The ceramics in question, numbering three vessels in all, were excavated many years before by Clarence B. Moore and illustrated by him.[2] They were taken from a sand burial mound in association with a number of other artifacts and with human burials. In our 1944 analysis it was pointed out that these Crystal River specimens exhibited the same technical processes of decoration—a negative or resist-dye application of a dark design background over a lighter-colored surface—as that seen on numerous Middle Mississippian pottery bottles; nevertheless, it was also made clear that the style of the painting, the forms of the vessels, and the quality of the ware were distinctly non-Mississippian. These occurrences of negative-painted specimens of a unique type on the Florida Gulf Coast raised an interesting question of cultural context. If the Crystal River burial mound could be dated as a unit within the late Middle Mississippian horizon or Temple Mound II stage of Southeastern prehistory, then the Crystal River negative-painted pieces, although aberrant stylistically, could be explained as the result of a common late diffusion of the resist-dye technique through the southern United States. On the other hand, if the Crystal River mound was considered as definitely and wholly earlier than the late Middle Mississippian horizon, the appearance of negative-painting on the Florida Gulf would be the earliest known instance of the method in the East.

The resolution of this problem of cultural context was attempted in the 1944 paper. The dating of the Crystal River mound turned mainly upon the point whether its contents could be placed as prior to or after the Weeden Island period of the Gulf Coast. A pre-Weeden Island dating would have successfully established Crystal River and its negative-painted style on the Hopewellian horizon; a post-Weeden Island dating would have extended it upward in time to overlap the Florida Ft. Walton period and, by inference, the Etowah-Tennessee-Cumberland manifestations of Middle Mississippi. Our conclusions at that time were somewhat hedged but leaned toward the interpretation that the Crystal River burial mound was late, late enough, in fact, to have been influenced by the Etowah and Ten-

* Published by permission of the Secretary, Smithsonian Institution.
[1] Willey and Phillips, 1944.
[2] Moore, 1903, Figs. 27, 28, and 31 on pp. 388, 389, and 391.