

SALT AND THE MAYA: MAJOR PREHISPANIC TRADING SPHERES*

Anthony P. Andrews

Introduction

In recent years, Maya scholars have been increasingly interested in the role of trade in the development of Maya civilization, and a growing number of studies have sought to explain the interrelationships between trade and cultural processes and their consequent impact on historical events in the Maya area. A growing concern for the resources exchanged in prehispanic trade networks has also developed as a logical extension of this subject. Many exotic trade goods recovered from archaeological excavations, such as polychrome pottery, obsidian, jade and metal, have been and still are the subject of in-depth studies. However, many equally important trade resources, which are perishable and therefore not recoverable in archaeological context, have not received adequate attention (Rathje, 1971; Dillon, 1975). Perhaps the only major exception is cacao, which was used as currency throughout Mesoamerica in prehispanic times. Through recourse to indirect sources of information, such as ethnohistoric accounts and modern ethnographic and agricultural data, Millon (1955) and Bergmann (1959) have provided a broad basis for reconstructing the distribution, production and trade of this resource prior to the conquest. The same approach can be applied to other major trade items of the Maya, such as cotton, honey, wax, jaguar pelts, exotic feathers, rubber, copal, agave fiber, tobacco, spices, salt and a whole range of faunal and vegetal foodstuffs. Some of these resources have been dealt with in preliminary studies

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(Cardós de Méndez, 1959; Thompson, 1970; Large, 1974; Dillon, 1975; A.P. Andrews, n.d.a), though in general they have been neglected. In fact, these resources have been discussed in many major trade studies, but since they have not been researched in any depth, statements about them have remained at the level of broad generalizations, and our understanding of their role in the trade networks is often vague and sometimes erroneous.

Our knowledge of salt in the Maya area exemplifies the point. Salt is one of the most widely discussed trade items in recent studies, yet our information regarding its sources, production and trade is somewhat fragmentary. Few scholars have focused on this resource in any depth. Foremost among them was Miguel Othón de Mendizábal (1929), whose ethnohistoric survey of Mexican salt sources in the 1920's remains the basic reference work on the subject. Unfortunately, this encyclopedic study dealt with the Maya area in a peripheral and fragmentary manner. In 1932, Frans Blom published his pioneering essay on Maya trade and stressed the importance of salt as one of the major long-distance exchange items of the Maya. Later scholars, notably McBryde (1947), Thompson (1970), Dillon (1975, 1977) and Eaton (1978), have contributed substantial information on the subject.

In addition to basic data gathering, archaeologists have advanced several hypotheses regarding the impact of the salt trade on historical events in the Maya area. It has been attributed a prominent role in the rise and fall of the Classic Maya cities of the southern lowlands (Rathje, 1971, 1973), and in the development of the large cities on the northern plains of Yucatan (Andrews IV, 1968). Scholars have also suggested that a desire to control the north coast salt beds and related trade networks was a major incentive behind the foreign intrusions that overwhelmed Yucatan in the 10th and 11th centuries (Mendizábal, 1929; Ball and Eaton, 1972). In

fact, it would appear that the marked centralization of wealth and power that characterized Chichen Itza in Early Postclassic times was due in large part to its control of the Yucatecan salt sources and coastal trade networks (A.P. Andrews, 1978).

These are only a few examples of instances in which the salt trade could have influenced events in Maya history, but they are only preliminary statements. Further research is needed to reinforce them and provide a broader view of the role of salt in Maya civilization.

The Maya Salt Project

In 1974, I began to collect material on the distribution, production, and trade of salt in the Maya area. To my surprise, I discovered a vast amount of previously untapped information on the subject, and to date have culled material from over 600 published and documentary sources.

Data on salt sources are, however, fragmentary. Often our only record of a given source is a brief mention in an obscure travel account, and there is seldom information on how the salt is produced, or how much, or for how long a given source has been exploited.

Moreover, during the last 30 years, large coastal salt producers utilizing modern solar evaporation techniques have gradually taken over the salt markets and edged out smaller competitors employing traditional, primitive salt-working methods: native salt-making industries which have been functioning for centuries are quickly disappearing throughout the Maya area.

For these reasons, I felt that it was necessary to conduct a field survey of salt sources, and did so from May, 1976 to May, 1978. Altogether, I traveled over 100,000 kilometers, mostly by jeep, though also by airplane, helicopter and small watercraft. The area of study encompassed past and

present salt-making localities along the Gulf and Caribbean coasts of Mexico and Belize, and those located in the highlands and Pacific coasts of Chiapas, Guatemala and El Salvador (Fig. 1).

In addition to locating each source, I interviewed hundreds of informants: these included government officials, salt company executives, owners of individual salt works, as well as countless numbers of salt workers, traders and retailers. Particularly valuable was the information of elderly people, often the sole source of information in localities where salt-works had long been abandoned.

Historical research was a concomitant part of the survey, and I conducted an extensive search for materials in libraries and archives in Yucatan, Chiapas and Guatemala.

I also studied available archaeological reports, and, to obtain information concerning the antiquity of many of the salt-works, held consultations with archaeologists working in different areas. Where time and circumstances permitted, I made limited archaeological surveys in order to gather evidence for the prehistoric exploitation of given salt sources.

The survey aimed at gathering the following kinds of data:

- 1) Location and description of each salt source and the techniques employed in its exploitation.
- 2) A history of the production of each source, from prehispanic times to the present.
- 3) Compilation of past and present production figures and estimates of the potential production of each source.
- 4) A history of the past and present trade range of each source.
- 5) Data on salt consumption in the Maya area, both for dietary and other purposes.

The documentation of all aspects of any given salt source was not always possible. Still, the survey produced a broad body of data that will add considerably to our knowledge of this resource in the Maya area.¹

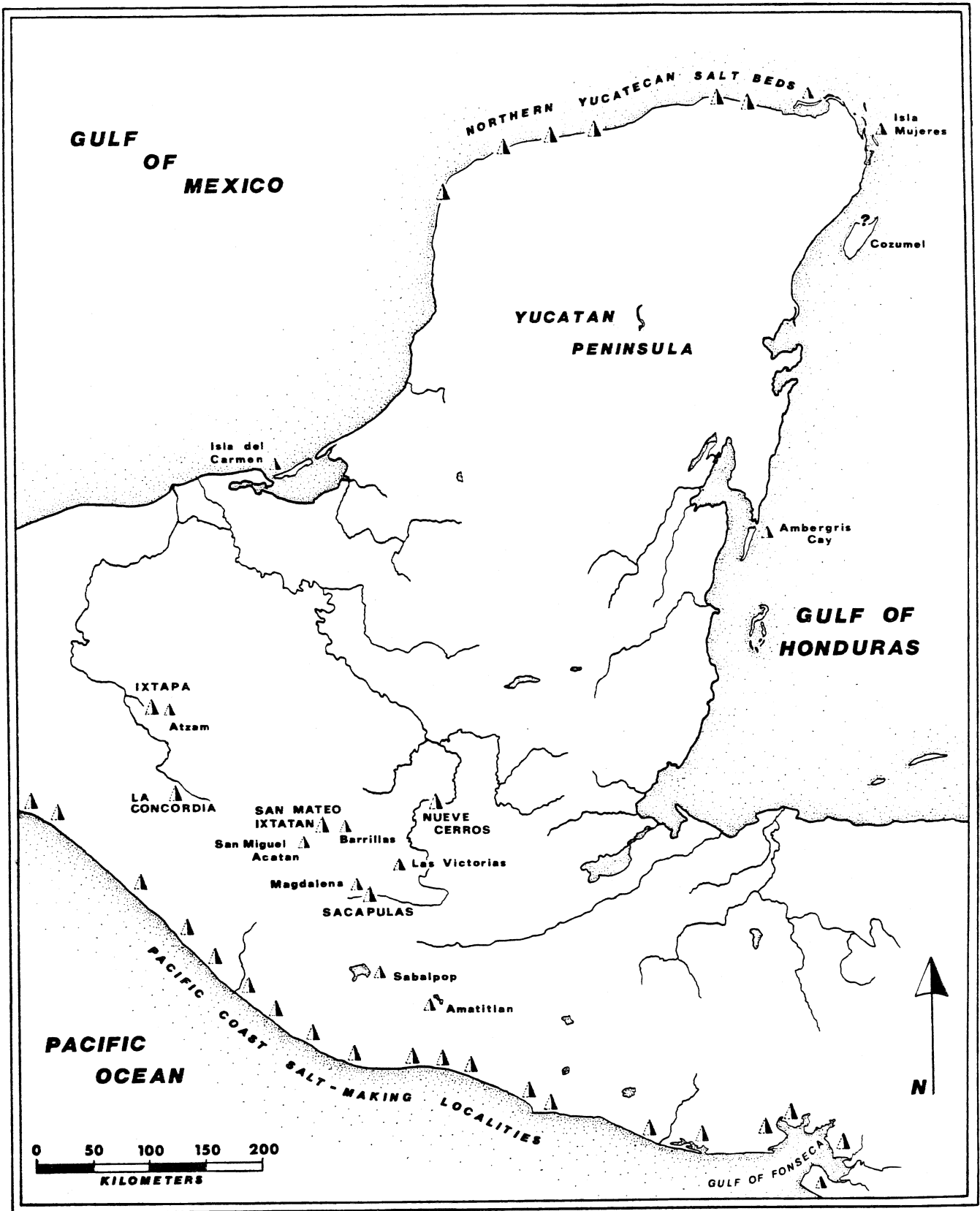


Figure 1. Distribution of Salt Sources in the Maya Area

Salt Production and Trading Spheres

Salt sources in the Maya area can be divided into two broad categories: coastal and interior. The vast majority of the salt consumed by the Maya has always come from coastal sources, either from northern Yucatan, or from the Pacific coasts of Chiapas, Guatemala and El Salvador. In addition, several minor sources, spread about the interior of Chiapas and Guatemala, have supplied inland areas where coastal salt was not available. All but one of these sources are located in the highlands. The most important include Ixtapa and La Concordia in Chiapas, and San Mateo Ixtatan and Sacapulas in western Guatemala. The one exception is Salinas de los Nueve Cerros, also known as Bolontehuitz, which is located in the northern lowlands of the Alta Verapaz in Guatemala. It is the only known inland salt source in the Maya lowlands, and is also the only source of salt in the southern lowlands.

Several scholars have noted that large areas of the central, southern and western lowlands lack sources of mineral salt. These areas must, therefore, have imported salt, particularly during the Classic period when they were densely populated. Most scholars now agree that at the height of the Classic period, around A.D. 800, the Maya lowlands had a population of five million or more inhabitants (Sanders, 1973:331-32; Willey and Shimkin, 1973: 476-77; Edward Kurjack, personal communication). Since each inhabitant would have required a daily intake of several grams of salt, this need could have only been satisfied by importing vast quantities through long-distance trade networks.

The existence of a long-distance Maya salt trade has long been recognized. It has been hypothesized that the salt-deficient areas of the lowlands acquired their salt from the north coast of Yucatan and Salinas de los

Nueve Cerros in the Alta Verapaz (Blom, 1932; Thompson, 1970; Rathje, 1971; Dillon, 1975). A few scholars have suggested that the lowlands also imported salt from the highlands (Smith and Kidder, 1951: 5; Rathje, 1971; Weaver, 1972: 158; Fox, 1978: 272-73), a point that has been questioned by at least two authors. Blom (1932: 536) and Dillon (1975: 102) have argued that the highland sources were minor production centers, capable of supplying only local needs.² Needless to say, these differing opinions could not be resolved without any quantitative data. This situation was one of the reasons that led me to conduct a field survey of salt sources.

One of the first objectives of the salt survey was to investigate the potential production of the highland sources. I also gathered data on salt consumption in order to determine the minimal salt requirements of populations in the Maya area. The results of this two-pronged approach were quite conclusive: highland sources could not have supplied the lowlands with salt.

Salt consumption patterns are a crucial part of this argument. Human beings need a minimum of 1 to 2 grams a day to survive. People living in temperate climates require about 4 to 6 grams a day; hardworking laborers in tropical regions need a minimum of 8 to 10 grams per day. Most people consume more than necessary, however, and average daily intake worldwide varies from 5 to 20 grams, and in some areas, is as high as 30 grams (Dauphinee, 1960: 413-14; Grollman, 1961: 593; Gaman and Sherrington, 1977: 42). The daily salt requirement can be satisfied through intake of mineral salt, or through indirect dietary means. In western societies, pre-packaged foods, meat and fish can satisfy basic sodium needs. Natural vegetal foods, however, have a very low sodium content (Gaman and Sherrington, 1977: 42), and inland agricultural populations, whose diet is predominantly made up of

vegetables and cereals, need to supplement their meals with mineral salt. The vast majority of the Maya fall into this category.³

The average daily intake of the Maya varies from 8 to 10 grams, a figure close to the bare minimum required in the tropics. Salt company officials in Mexico, Guatemala and El Salvador estimate daily per capita consumption of table salt to be 10 grams. Ethnographic nutritional studies (Redfield and Villa Rojas, 1934: 57; Ariás García, 1972: 74) and data from informants in various localities of the Maya area suggest a daily per capita consumption of 8 grams. I believe this figure to be the most accurate for native communities, and a reliable indicator of prehispanic consumption as well. Peterson (1977) has calculated that the average daily intake in prehispanic Oaxaca was also 8 grams.

Given this figure, it is possible to arrive at some general estimates for salt consumption in the Maya lowlands during the Classic period. At 8 grams a day per capita, five million people would need 40 tons a day, or 14,600 tons a year. This is a substantial amount of salt, and we ask the obvious question: where did it come from?

The possible sources are limited. As far as we know, Pacific coast salt never reached the Maya lowlands in prehispanic or colonial times. A substantial body of ethnohistoric data and 19th century production figures indicate that Pacific coast sources were unable to satisfy the demand of even the adjoining highland areas. Because of this situation, the highland sources were very important, and were heavily exploited.

The survey located 11 salt sources in the highlands of Chiapas and Guatemala (A.P. Andrews, n.d.a). I gathered production data on most of these localities, as well as information on past trade patterns. Only four localities can produce salt in any significant quantities. Ixtapa, in

Chiapas, and San Mateo Ixtatan and Sacapulas, in Guatemala, have a potential production of approximately 100 tons a year; each source could thus only supply about 34,000 people. In short, these sources are only capable of supplying limited regions. Historic documentation and data from informants familiar with the highland salt trade networks reinforce such a notion. The trade of Ixtapa salt appears to have been restricted to the central highlands of Chiapas and parts of the adjacent Grijalva river basin. The salt from San Mateo Ixtatan has traditionally been traded southwards throughout an area presently comprising the departments of Huehuetenango, Totonicapán and Quetzaltenango; this trade pattern dates back to the conquest. Sacapulas salt appears to have been traded within the present day departments Quiché, Baja Verapaz and Huehuetenango. On the basis of these data, I think we can safely assume that these localities did not supply the lowlands with any appreciable quantities of salt.

There is only one highland source that may have supplied some limited quantities of salt to the western fringes of the lowlands. The salinas of La Concordia, in the central depression of Chiapas, appear to have been a major center of production. There is little historical information on La Concordia, which was flooded when the Angostura dam was built in the early 1970's. However, its potential annual production in the 1940's was estimated at 200 tons (De la Peña, 1951, IV: 1204), enough to supply the basic needs of approximately 68,000 people. According to available records and local informants, the salt was marketed throughout the central depression, from Chiapas de Corzo to Chicomucelo, and eastwards to Comitán and Las Margaritas. From Las Margaritas, small quantities were transported to adjacent lowland regions.

The overall conclusion we can draw is that the lowland Maya could not have imported any significant quantities from the highlands. Moreover,

the lowlands had no need for highland salt, for the coastal flats of northern Yucatan represent the single largest source of salt in Mesoamerica.⁴ Spread along the Yucatan coast, from the Celestun peninsula to the northeastern port of El Buyo, these salt beds have been continuously exploited for more than 2,000 years (Eaton, 1978; A.P. Andrews, n.d.a). In 1917, prior to the advent of modern technology, potential production was estimated at 60,000 tons a year (Zarate, 1917: 30), or enough to supply the basic needs of over 20 million people. While the actual production figures of prehispanic times are not known, a survey conducted in 1603 indicates that they were producing more than 17,300 a year (AGI-Mexico 72; cited in Roys, 1957), sufficient salt for more than 5.9 million people.

In addition to the north coast beds, there are several other localities on the Yucatan peninsula where salt was once harvested. On Isla del Carmen, Campeche, a few small pans were exploited in the mid-19th century, but I was unable to determine if they were in use in earlier times. Small salt-pan operations were also active on Isla Holbox and Isla Mujeres in Quintana Roo, and at Ambergris Cay in northern Belize. The latter two sources were exploited in prehispanic times; all three sources have been exploited until recently. A possible fifth source, the shallow lagoons behind the north coast of Cozumel island, may have been exploited in prehispanic and early colonial times, but substantial proof is lacking.

None of these localities produced any significant quantities of salt. On the basis of informant interviews and my own field observations, I estimate that the combined potential production of these sources could not have exceeded 1,000 tons a year.

Another source which would have supplied salt to certain regions of the southern lowlands is Salinas de los Nueve Cerros. The prehispanic

community at Nueve Cerros dates to Late Formative or earlier times. There is definite evidence of salt production in Early and Late Classic times, and the site appears to have been abandoned during the Postclassic period (Dillon, personal communication). This source, a salt spring, was exploited in the 19th and early 20th centuries by several Guatemalan entrepreneurs. Around the turn of the century, the spring was producing approximately 100 tons a year (Sapper, 1901: 176). The last operator, who stopped production in 1937, informed me that his highest yield from the source was 180 tons annually; he estimates the potential production of the source at close to 300 tons a year.⁵

Altogether, the lowland salt sources were capable of producing a minimum of 18,600 tons of salt a year, enough to supply the needs of 6.3 million people.⁶

As the present data suggest, the Maya salt trade networks operated in two almost mutually exclusive northern and southern spheres. The northern sphere encompassed the entire Maya lowlands, from western Tabasco to the Gulf of Honduras. The southern sphere included the highlands, piedmont and Pacific coastal plain of Chiapas, Guatemala and El Salvador.

Throughout most of their history, the people living in the northern sphere acquired their salt from the coastal lagoons of northern Yucatan, and, to a lesser degree, from the minor sources located along the Gulf and Caribbean coasts. Salinas de los Nueve Cerros was also in this lowland sphere, and was likely a major source of salt for certain areas of the southern lowlands, at least during Early and Late Classic times. Given the geographic distribution of the lowland sources, large areas were supplied through long-distance trade networks. The bulk of this trade moved along the coasts and up rivers; from river terminals it continued by land to its varied destinations in the interior.

The salt trade of the southern sphere appears to have been quite different from that of the north. Highland salt springs and coastal lagoons are dispersed throughout the southern sphere, and most communities were located less than 100 kilometers from salt-producing localities. Hence, distribution of salt was handled through highly localized trade networks that involved short distances and small quantities. Even though most of the highland and Pacific sources had a low production potential, they were able, collectively, to supply most of the needs of the population living in the southern sphere.

There are only a few instances in which salt crossed from one sphere to another, and these would appear to have been minor trade operations. Salinas de los Nueve Cerros may have supplied some salt to the neighboring highlands of the Verapaz (Thompson, 1970: 135, 150), but such a pattern remains to be substantiated. Also, the salinas of La Concordia may have supplied small quantities of salt to the adjacent Chiapas lowlands.

Conclusions

I believe it is important to focus not only on the obvious conclusion of this paper, i.e., that the lowland Maya salt trade was an internal affair, and not part of a larger highland-lowland exchange system, but also on the methods which enabled me to arrive at these conclusions.

A central objective of the salt project is to demonstrate the usefulness of inter-disciplinary research in the study of Maya trade. This kind of research is essential in the investigation of perishable trade resources. While the Maya salt project was primarily an archaeological one, and involved some archaeological surveying, most of the research was historically and ethnographically oriented. The most important goal of the project was to quantify the salt production and consumption patterns of the prehispanic Maya.

In order to do so, a variety of different approaches were used. Historical research and informant interviews yielded the most data. First-hand observation of salt-making methods was an important part of the research, as it enabled me to arrive at reasonably accurate estimates of production at many sources. Also useful were nutritional and medical surveys, travel accounts, ethnographic reports, government tax records, newspaper accounts, geological reports and salt company records.

I hope that this project will show that there is a broad range of data which can be used in the reconstruction of ancient trade systems, and that it will demonstrate the need for an interdisciplinary approach to encompass the disparate sources which can be utilized. In particular, the study of ancient salt trade networks requires a knowledge not only of archaeological data, but also of ethnohistoric, ethnographic and modern industrial data. Hopefully, this project will provide some guidelines for such studies in other parts of the world.

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Notes

¹ The preliminary report of the salt project includes a list of the salt sources in the Maya area, and a summary of the history and archaeology of each source (A.P. Andrews, n.d.a). A second paper deals exclusively with the salt sources of El Salvador (A.P. Andrews, n.d.b). The final report of the project will be presented as a Ph.D. dissertation at the University of Arizona in Tucson.

- ² These differing opinions are further confused by a misunderstanding of the geographical location of Salinas de los Nueve Cerros. Blom (1932) and Rathje (1971) place this source in the highlands. Dillon, (1977) has shown, quite conclusively, that it is a lowland source.
- ³ Pohl (1976) has suggested that the Maya of the southern lowlands could have satisfied their salt needs through indirect dietary means, such as meat consumption and intake of salt substitute derived from palm ash. Meat does have sodium, though in small quantities, and an individual would have to consume more than a pound a day to satisfy his sodium requirements. Contrary to Pohl's arguments, a large body of nutritional data indicates that the Maya have traditionally had a protein- and sodium-deficient diet. There is also some archaeological evidence for nutritional stress during the Late Classic period (Haviland, 1967; Saul, 1972). The burning of certain species of palms to obtain a salt substitute from the ashes has been reported in the Maya area in historic times. However, it is an extremely laborious process and yields very small quantities of salt. Palm ash cannot be considered a viable source of salt for a large population. These alternative sources of salt will be discussed at length in the final report of the project.
- ⁴ It is estimated that, with the aid of modern technology, the Yucatecan salt beds could produce 2.5 million tons a year (Solís Preciat, 1969:45).
- ⁵ This estimate is tentative. Experiments conducted by Brian Dillon at Nueve Cerros may suggest a higher figure (Dillon, personal communication).
- ⁶ These are very general estimates, and do not take into consideration several other factors that may have affected the volume of the salt trade. For example, a large amount of salt from the coastal sources was probably used for salting fish and meat, a practice which was common among the Maya at the time of conquest (Tozzer, 1941: 190; Roys, 1943:47). On the other hand, a significant percentage of the population lived near the sea and had little need for mineral salt. These factors will be dealt with in the final report, though I doubt we will ever be able to control them in a quantitative fashion.

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