Alabama Archaeological Society

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STONES & BONES NEWSLETTER

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PALEOLITHIC NUTRITION

Humanity has existed as a genus for about two million years, and our prehuman hominid ancestors, the australopithecines, appeared at least four million years ago. This phase of evolutionary history made definitive contributions to our current genetic composition, partly in response to dietary influences at that time. The foods available to evolving hominids varied widely according to the paleontological period, geographical location, and seasonal conditions, so that our ancestral line maintained the versatility of the omnivore that typifies most primates. Natural selection has provided us with nutritional adaptability; however, human beings today are confronted with diet-related health problems that were previously of minor importance and for which prior genetic adaptation has poorly prepared us.

The human genetic constitution has changed relatively little since the appearance of truly modern human beings, *Homo sapiens sapiens*, about 40,000 years ago. Even the development of agriculture 10,000 years ago has apparently had a minimal influence on our genes. Differences between the dietary patterns of our remote ancestors and the patterns now prevalent in industrialized countries appear to have important implications for health, and the specific pattern of nutritional disease is a function of the stage of civilization. Physicians and nutritionists are increasingly convinced that the dietary habits adopted by Western society over the past 100 years make an important etiologic contribution to coronary heart disease, hypertension, diabetes, and some types of cancer. These conditions have emerged as dominant health problems only in the past century and are virtually unknown among the few surviving hunter-gatherer populations whose way of life and eating habits most closely resemble those of preagricultural human beings.

During the Miocene era (from about 24 to about 5 million years ago) fruits appear to have been the main dietary constituent for hominids, but their fossilized dental remains seem suitable for mastication of both animal and vegetable material. After the divergence of the human and ape lines (now thought to have occurred between 7.5 and 4.5 million years ago), our ancestral feeding pattern included increasing amounts of meat.

The importance of vegetable foods is harder to assess, since plant remains are poorly preserved. Fossilized fruit pits and nuts are commonly found, but tools for processing plant foods are conspicuously absent in comparison with their widespread proliferation in later prehistory. Shells and fish bones are unknown in archaeological material dating from before 130,000 years ago and are found infrequently in material dating from before 20,000 years ago, so that, in paleontological terms, widespread use of aquatic foods is a recent phenomenon.

Agriculture markedly altered human nutritional patterns: over the course of a few millenia the proportion of meat declined drastically while vegetable foods came to make up as much as 90 per cent of the diet. This shift had prominent morphologic consequences: early European *Homo sapiens sapiens*, who enjoyed an abundance of animal protein 30,000 years ago, were an average of six inches taller than their descendants who lived after the development of farming. The same pattern was repeated later in the New World: the Paleoindians were big-game hunters 10,000 years ago, but their descendants in the period just before European contact practiced intensive food production, ate little meat, were considerably shorter, and had skeletal manifestations of suboptimal nutrition, which apparently reflect both the direct effects of protein-calorie deficiency and the synergistic interaction between malnutrition and infection.

Paleolithic populations obtained their animal protein from wild game, especially gregarious ungulate herbivores, such as deer, bison, horses, and mammoths. The nutritional quality of such meat differs considerably from that of meat available in the modern American supermarket; the latter has much more fat - in subcutaneous tissue, in fascial planes, and as marbling within the muscle itself. Domesticated animals have always been fatter than their wild ancestors because of their steady food supply and reduced physical activity, but recent breeding and feeding practices have further increased the proportion of fat to satisfy our desire for tender meat. These efforts have succeeded: modern high-fat carcasses are 25 to 30 percent fat or even more. In contract, a survey of 15 different species of free-living African herbivores revealed a mean carcass fat content of only 3.9 per cent. Not only is there more fat in domesticated animals, its composition is different; wild game contains over five times more polyunsaturated fat per gram than is found in domestic livestock.

Meat from free-living animals has fewer calories and more protein per unit of weight than meat from domesticated animals, but the amino acid composition of muscle tissue from each source is similar. Since the cholesterol content of fat is roughly equivalent to that of lean tissue, the cholesterol content of game would not be expected to differ substantially from that of commercially available meat.

Representative nutrient values for wild game and vegetable foods consumed by recent hunter-gatherers can be derived from the literature. In turn, these figures can be used to estimate the daily nutrient intake for paleolithic human beings. Estimates of energy intake and various animal:

vegetable ratios in subsistence patterns can be generated. Although the specific dietary constituents used by any particular group of preagricultural human beings must have varied with ambient conditions, average nutrient values should reflect central tendencies transcending these effects.

Proposed Average Daily Macronutrient Intake
for Late Paleolithic Human Beings Consuming a 3000-kcal Diet
Containing 35 per cent Meat and 65 per cent Vegetable Foods

	Intake (g)
Protein	251.1
Animal	190.7
Vegetable	60.4
Fat	71.3
Animal	29.7
Vegetable	41.6
Carbohydrate	333.6
Fiber	45.7

Even at the lowest estimate of the ratio of meat to plant food (20:80), by modern standards, the estimated paleolithic diet would have been adequate in animal protein, iron, vitamin B12 and folate, whereas agricultural populations of the underdeveloped world in the 20th century have widespread deficiencies in these nutrients.

Because of the relatively high proportion of vegetable foods and the primitive character of food processing, paleolithic diets must have included substantially more nondigestible fiber than do typical Western diets. For a paleolithic diet containing 65 per cent vegetable foods, the estimated fiber content would have been 45.7 g.

Whether based on as much as 80 per cent or as little as 20 per cent meat, the paleolithic diet differed substantially from the typical diet in the United States today, and it also differed, although much less so, from that currently advocated by nutritionists and by the U. S. Government. The foods we eat are usually divided into four basic groups: meat and fish, vegetables and fruit, milk and milk products, and breads and cereals. Two or more daily servings from each are now considered necessary for a balanced diet, but adults living before the development of agriculture and animal husbandry derived all their nutrients from the first two food groups; they apparently consumed cereal grains rarely, if at all, and they had no dairy foods whatsoever, Nevertheless, with a diet containing 35 per cent meat, their calcium intake would have far exceeded the highest estimate of the minimal daily requirement. Neanderthals and Cro-Magnons who inhabited

subarctic Eurasia and whose diet is considered to have been most like that of the Eskimos, among recent populations, had massive bones, indicating that they obtained sufficient calcium. The probable paleolithic intake of dietary fiber was much higher than ours and approached that common in rural Africa, where disease conditions linked with deficient dietary fiber rarely occur, although paleolithic human beings obtained their fiber predominantly from fruits and vegetables rather than grain. A paleolithic diet consisting of 35 per cent meat would have contained only a sixth of the sodium in the typical American diet - a third of the level most recently recommended. Even in a diet with 80 per cent meat, the sodium intake would have just reached the lowest recommended level and would have been markedly below the lowest estimate of current intake. Given the typically wide variety of collected plant foods and assuming ascorbic acid to be representative, the vitamin intake of paleolithic human beings would have substantially exceeded ours, irrespective of the proportion of meat in the diet.

In the hunting society of our ancestors, meat provided a large fraction of each day's food, ensuring high iron and folate levels. Protein contributed twice to nearly five times the proportion of total calories that it does for Americans. Their high-meat diet contained a high level of cholesterol - similar to or even higher than the level in our diet; most paleolithic human beings must have greatly exceeded the U. S. Senate Select Committee's recommended cholesterol level. Conversely, they ate much less fat than we do, and the fat they ate was substantially different from ours. Whether subsistence was based predominantly on meat or on vegetable foods, the paleolithic diet had less total fat, more essential fatty acids, and a much higher ratio of polyunsaturated to saturated fats than ours does. In comparison with us, our paleolithic ancestors consumed more structural and less depot fat.

The extent to which some of the major chronic diseases of industrialized society are related to the typical Western diet is controversial, but evidence for an important linkage is steadily accumulating. Medical researchers in diverse fields are beginning to define a generally preventive diet - one of benefit against conditions ranging from atherosclerosis to cancer. Such investigations are converging in several ways with the studies of paleontologists and anthropologists. Ultimately, of course, only experimental and clinical studies can confirm hypotheses about the medical consequences of dietary choices. Nevertheless, it is both intellectually satisfying and heuristically valuable to estimate the typical diet that human beings were adapted to consume during the long course of our evolution. Points of convergence between this estimate and modern recommendations are encouraging, and points of divergence suggest new lines of research. The diet of our remote ancestors may be a reference standard for modern human nutrition and a model for defense against certain "diseases of civilization".

(From an article by S. Boyd Eaton, M.D., and Melvin Konner, Ph.D., in the New England Journal of Medicine, Volume 312, Number 5, January 1985)

The Editors

CHAPTER NEWS

Dothan Chapter

The Dothan Chapter met Sunday, June 30, in the Troy State University Building in Dothan. Guest speaker Mr. Buck Earnest, from the Corps of Engineers Office in Fort Gaines, Georgia, presented the program. Topics covered were: current status of the Rood Creek Site near Georgetown, Georgia, the Cemochochobee Site at Fort Gaines, and discussions of Public Law 9596 covering archaeological investigations within federal fee-owned lands. Several members asked questions concerning efforts to preserve sites as they are located and exactly what could and could not be done by private citizens to assist the Corps in location and protection of the site. Several members brought artifacts for comments, and these will later be placed in the Chapter Display Case located in Houston Hall in the Troy State Building.

The Dothan Chapter is seeking new members to meet with us and share views and experiences. Interested parties may contact Leonard Roberts at 793-1445, Greg Creel at 792-6033, or Clay Bell at 983-3378. The Chapter meets monthly in the Troy State Building in Dothan.

Clay Bell

Huntsville Chapter

The Huntsville Chapter meets the third Tuesday of each month. At the July 16 meeting, Dorothy Luke from Huntsville and Dr. John Wood of Haleyville spoke on the tour of Belize in February. Dorothy gave an overview of modern-day Belize, a brief history of the country, and then went on to speak of the archaeology of the area. Dorothy and Dr. Wood showed slides of the archaeological sites and other attractions on the tour. The oldest known Mayan site is in Belize; it and many other sites are preserved by private landowners and the Government of Belize as archaeological preserves. The tour covered the principal cities, including Belize City - the old capital and still the major city and port - and Belmopan - the new capital - where tour members were allowed to go through the Mayan treasures in the vaults of the Government's Department of Anthropology. Other towns and villages visited carry names like Orange Walk and Shipyard; the group spent some time in Rio Frio Cave, at the Hidden Valley Falls and in the attractive towns of Corozal and San Ignacio. Two of the archaeological sites visited were being excavated by teams from the U. S.; at other sites, the local caretaker and guide showed the group around. Belize, newly independent from Britain, is trying to develop its embryonic tourist industry. Present accommodations range from "resorts", geared to handle the well-heeled sport fishermen, through adequate motels to primitive camps, where one would definitely have to "rough it". Predictions are that in a few years, Belize will rival Cancun and Cozumel to the north as one of the "in" places to go on vacation. The fabulous archaeological sites of Cuello, Cerros, Xunantunich and Lamanai, among others, make the trip well worthwhile now.

Dorothy Luke

Tuscaloosa Chapter

The Tuscaloosa Chapter's June meeting was held at the town library. Our guest speaker was Dr. Jim Knight from the Office of Archaeological Research in Moundville, Alabama. Dr. Knight spoke and showed artifacts from historic Creek Indian sites in Alabama.

Bill Adkison

ANECDOTES

"Wolf Scalps - In Alabama five dollars premium are allowed for the scalp of every wolf taken and destroyed, to be paid out of the tax of the county in which the wolf is taken. In one county, the Tuscaloosa Republican says, more scalps have been taken than the whole taxes of the county will pay for! So that wolf catching is the best business followed there. The Republican suggests the propriety of paying the members of the legislature in scalps at five dollars a piece, until they repeal or modify the law. Not a bad notion."

(From Niles Register, January 27, 1821)

"A tyger, weighing 92 lbs. and measuring 6 feet 3 inches, was lately killed in the neighborhood of Blakely, Alabama."

(From Niles Register, October 19, 1822)

The Editors

BOOK REVIEW

Decoding Prehistoric Ceramics", Edited by Ben A. Nelson. Southern Illinois University Press, P. O. Box 3697, Carbondale, Illinois 62901. 1985, 459 pages. 52 tables, 82 figures and photos. 42-page bibliography. $35.

The book is the result of a symposium titled "The Explanation of Ceramic Variation", held at the 44th Annual Meeting of the Society of American Archaeology. The text is somewhat technical and deals with various analytical methods on why pottery varies with different cultures while serving the same functions. The contents are divided based on papers presented at the symposium:

Part One: Stylistic Variation and Social Organization
Part Two: The Organization of Ceramic Production
Part Three: Assignment of Form, Function and Context
Part Four: Further Lessons from Ethnoarchaeology
Part Five: Comment

The Editors

LETTER FROM AN A.A.S. MEMBER

We are always happy to hear from our members. The following is a letter from a loyal member and frequent contributor, Jim Farrior.

Archaeology is fun! -- and hard work! I wrote you about my four weeks at Colha, Belize in 1983, and six weeks at Copan in Honduras in 1984. This year, I spent two months in Guatemala participating in projects in the Peten at Tikal and Rio Azul.

The two weeks at Tikal were with an "Earthwatch" team under the direction of Dr. Gary Walters, an experienced Maya archaeologist. We lived in tents, and tromped through the jungle each day to reach the work site. Much cultural material was found, including some interesting polychrome pots. There was time for lectures, and visits to the nearby main ruins. We also took side trips to other Maya sites including Uaxactun, Yaxha, and Seibal. "Earthwatch" can be highly recommended as a way for amateurs to gain interesting hands-on experience.

After Tikal, I had ten days before the Rio Azul project was to begin, so I traveled through the highlands, visited the museum in Guatemala City, and visited the Maya sites of Quirigua and Kiminaljuju. During this time, the members of Dr. Richard Adams' archaeological team arrived in Guatemala City and made preparations for the dig. Rio Azul is a very large and important Maya site in the extreme northern part of the Peten. For Dr. Adams, the Project Director from the University of Texas at San Antonio, and some other team members, this season was a continuation of their very successful project at Rio Azul (see p. 137, National Geographic, Aug., 1984). I had been invited to join them.

At Flores, four-wheel-drive vehicles were obtained, as well as additional supplies, and a team of native workmen. The road between Flores and Tikal was paved, and the road on to Uaxactun was fair. At Uaxactun, we took a logging road, which became worse as we traveled. After a long hard, muddy trip through dense jungle, we arrived at Dos Lagunas, a very small, almost abandoned village, where we camped for the night. Upon awaking, I saw a mule standing outside my tent with blood running down his neck from a wound inflicted by a vampire bat during the night! Another day of rough traveling through the jungle brought us to our permanent campsite, an abandoned chiclero camp called Ixcanrio.

At Rio Azul, we excavated in selected areas and did a lot of surveying. I had the good fortune of being assigned to work with Prof. Jack Eaton, with whom I had worked at Colha, Belize.

National Geographic was a sponsor, and an article should appear soon. Until then, I can't say much about what was discovered. However, we did find a large amount of cultural material, examined a number of interesting structures and tombs, and mapped a large area covered with large and small mounds, some of them containing buildings. We also took a long hike through the jungle to Kinal, another large Maya site with many standing buildings.

The Alabama Archaeological Society is doing a fine job. Keep it up! Please give my regards to my friends.

James S. Farrior
Merritt Island

PUBLICATIONS AVAILABLE

Available issues of *Journal of Alabama Archaeology* Vol. 20-29 each issue ..... ($2.50 to Members)	$5.00 pp
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Special Publication 3 — *Archaeological Investigations at Horseshoe Bend*	$6.50 pp
Handbook of Alabama Archaeology Part 1, Point Types	$10.00 pp
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Exploring Prehistoric Alabama through Archaeology (Juvenile)	$7.00 pp

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