



On Sedentism and Cereal Gathering in the Natufian

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Discussion and Criticism¹

On the Planning of Scientific Meetings: Reply to Wolpoff

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As one of the organizers of the 1992 Royal Society and CIBA meetings, I dispute Wolpoff's suggestion of bias in our planning of the meetings, which were not, in fact, primarily about multiregional versus recent African origin models. Wolpoff and several like-minded colleagues were invited to attend the Royal Society meeting, and one of them (Fred Smith) presented a paper. Wolpoff's close associate, Alan Thorne, was allotted time to speak at the accompanying CIBA symposium but had to withdraw because of illness.

Regarding Templeton's critiques of mtDNA analyses, it should be remembered that these had not been written when we planned the meetings in 1990, but they were certainly discussed at the meetings, referenced in the ensuing publications (Aitken, Stringer, and Mellars 1993), and alluded to in my 1992 report (CA 33:600–603). However, those who believe, with Wolpoff, that Templeton's critiques have eliminated genetic support for a recent African origin for modern humans should certainly keep an eye on current publications (see, for example, Harpending et al. 1993, Hasegawa et al. 1993, Nei and Roychoudhury 1993, Ruvolo et al. 1993, Rzhetsky and Nei 1993, Stoneking 1993, and Stringer and Gamble 1994).

Readers should also carefully compare Wolpoff's comments with my own account of the meetings. Considering the tone of his comments in CA and elsewhere (Wolpoff 1994), the scientific value of his published statements about the dating of sites such as Cro-Magnon, Border Cave, Klasies, Irhoud, and Krapina, and his belief that "modern humans are a state of mind" (Wolpoff 1994), readers will perhaps appreciate why he was not invited to present a paper at meetings in which reasoned discussion of dating evidence for the origins of modern humans was a primary expectation.

Finally, to return to Wolpoff's accusation of bias in my planning and reporting of the Royal Society meeting, a quotation from Matthew 7:5 (New English Bible) may be an appropriate response: "First take the plank out of your own eye, and then you will see clearly to take the

speck out of your brother's." Reference to Stringer (n.d.) and Lewin (1993:63–64) will, I hope, make the relevance of this quotation clear to the readers of this journal.

References Cited

- AITKEN, M., C. STRINGER, AND P. MELLARS. 1993. *The origin of modern humans and the impact of chronometric dating*. Princeton: Princeton University Press.
- HARPENDING, H., S. SHERRY, A. ROGERS, AND M. STONEKING. 1993. The genetic structure of ancient human populations. *CURRENT ANTHROPOLOGY* 34:483–96.
- HASEGAWA, M., A. DI RIENZO, T. KOCHER, AND A. WILSON. 1993. Towards a more accurate time scale for the human mitochondrial DNA tree. *Journal of Molecular Evolution* 37:347–54.
- LEWIN, R. 1993. *The origin of modern humans*. New York: Scientific American Library.
- NEI, M., AND A. K. ROYCHOUDHURY. 1993. Evolutionary relationships of human populations on a global scale. *Molecular Biology and Evolution* 10:927–43.
- RUVOLO, M., S. ZEHR, M. VON DORNUM, D. PAN, B. CHANG, AND J. LIN. 1993. Mitochondrial COII sequences and modern human origins. *Molecular Biology and Evolution* 10:1115–35.
- RZHETSKY, A., AND M. NEL. 1993. Theoretical foundation of the minimum-evolution method of phylogenetic inference. *Molecular Biology and Evolution* 10:1073–95.
- STONEKING, M. 1993. DNA and recent human evolution. *Evolutionary Anthropology* 2:60–73.
- STRINGER, C. B. 1992. Exploring modern human origins: Progress and prospects. *CURRENT ANTHROPOLOGY* 33:600–603.
- . n.d. A comment on Wolpoff's review of *The origin of modern humans and the impact of chronometric dating*. *American Journal of Physical Anthropology*. In press.
- STRINGER, C. B., AND C. GAMBLE. 1994. The Neanderthal world: Flat earth or new horizons? *Cambridge Archaeological Journal* 4:96–119.
- WOLPOFF, M. H. 1993. Our readers write. *CURRENT ANTHROPOLOGY* 34:567–68.
- . 1994. Review of: *The origin of modern humans and the impact of chronometric dating*, by M. Aitken, C. Stringer, and P. Mellars (Princeton: Princeton University Press, 1993). *American Journal of Physical Anthropology* 93:131–37.

On Sedentism and Cereal Gathering in the Natufian

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Moore's comments (CA 35:48–49) on seasonal mobility and agriculture in the Levant merit a reply. Lieberman's ideas (CA 34:599–663) were explicitly offered as working hypotheses to explain certain aspects of cultural

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change in the Levant using admittedly limited but heretofore unavailable data on seasonal mobility. While Moore's interest is appreciated, his four major criticisms are all problematic.

He questions the assumption that the behavioral ecology of mountain gazelle (*Gazella gazella*), upon which the seasonality estimates are mainly based, remained relatively stable over the Late Pleistocene. Yet there is overwhelming evidence that the Mediterranean (forest) and Irano-Turanian (steppic) vegetational zones remained essentially unaltered in terms of species composition during this entire period (Tchernov 1988, 1991, 1992; Garrard 1982, 1984). Although it is clear that the geographic distribution of these zones changed as a result of Upper Pleistocene climatic fluctuations, mainly by expanding and contracting within a limited range, the floral and faunal composition remained the same throughout the period (Weinstein-Evron 1990, van Zeist and Bottema 1991). Therefore, climatic change would not have had a large impact on gazelle diets or behavior. Moreover, even if climatic fluctuations had been severe, there would be no basis for arguing that gazelle diets or seasonal patterns changed much, since mountain gazelle are territorial and nonmigratory and switch from browsing to grazing in both steppic and forest vegetational zones (Baharav 1981, 1983). Other than some slight changes in body size, there are no morphological data to suggest any differences between the modern mountain gazelle and those from 100,000 years ago (Garrard 1980, Cope 1991). The changes in the ratio of gazelle to deer at Tabün (Bate 1937) and Ksar Akil (Hooijer 1961) noted by Moore certainly reflect some climatic change but are also influenced by cultural changes and especially by the sampling strategies of these early excavations (Garrard 1982).

Moore is uncomfortable with the evidence that hunter-gatherers preferred lowlands in one season and uplands in another but does not contradict the data which suggest that almost every Levantine Palaeolithic and Epipalaeolithic site was occupied during only some seasons and not others. While the occupation of some Upper Palaeolithic sites in the lowlands along ecotones (e.g., el-Wad D and Kebara III-I) during different seasons could reflect local conditions (see Lieberman 1993b) or their different ages (table 1), it was not argued that hunter-gatherers had one simple pattern of seasonal mobility. Instead Lieberman suggested that one should expect some variability in terms of mobility patterns, often related to local conditions, and that two basic strategies of circulating mobility could explain most of the variability in site seasonality: one in which hunter-gatherers occupied the highlands during the spring and summer and the lowlands during the fall and winter and another in which hunter-gatherers occupied the highlands during the summer and fall and the lowlands in the winter and spring. If anything, the variability and complexity of resources noted by Moore at ecotonal sites such as those along the coastal plain makes one wonder why there is not more evidence for multiseasonal occupation over long time periods.

He is undoubtedly correct in pointing out that Neanderthals probably did not occupy their sites year-round. We could not agree more, and it was not suggested that Neanderthals were sedentary. Lieberman pointed out several times (p. 609) that the evidence for multiseasonal occupation of Tabün B-phase sites "suggests a radiating mobility pattern in which humans repeatedly returned to the same sites (perhaps base camps) over the course of many seasons (although it is unlikely that these were sedentary sites)." Hietala and Stevens (1977) came to an essentially similar conclusion concerning the Mousterian site Rosh Ein Mor in the Negev highlands on the basis of repeated deposited lithic clusters of similar typology. The only major similarity between the Natufian and "Tabün-B-type" Mousterian occupations is the evidence for multiseasonal hunting of gazelle and the practice of radiating mobility.

The issue of Natufian sedentism and increased cereal consumption is of prime importance. Moore is incorrect to reject any link between the nature of the Natufian occupations and cereal consumption. First, he ignores the direct botanical evidence for cereal consumption during the Epipalaeolithic. He asserts that the first unequivocal evidence for agriculture in the form of domesticated cereals is from about 10,000 B.P. (Zohary and Hopf 1988, Hillman and Davies 1990, Miller 1992), but this interpretation is not shared by all palaeoethnobotanists or archaeologists. Kislev (1989), for example, interprets only the carbonized cereals from Pre-Pottery Neolithic B sites as domesticated. Beyond the debate about the morphological characteristics of the grain and the internodes (Zohary 1992, Kislev 1992), there is ample evidence for the gathering of undomesticated cereals in the Jordan Valley by at least 19,000 B.P. from the site of Ohalo II. This waterlogged site, published by Nadel and Hershkovitz in 1991 (CA 32:631-35; see also Kislev, Nadel, and Carmi 1992), has yielded numerous carbonized remains of undomesticated barley from either pre-Kebaran or early Kebaran cultural contexts. The list of cereals from Ohalo II includes the following species (from Kislev, Nadel, and Carmi 1992: table 1): *Aegilops geniculataperegrina*, *Avena barbata* Pott ex Link, *Avena sterilis* L., *Bromus* sp., *Catabroasa aquatica* (L.) Beauv., *Hordeum bulbosum* L., *H. glaucoideum* Steudel, *H. spontaneum*, *Triticum dicoccoides* (Koernicke) Aaronsohn, *T. dicoccoides*, and unidentified grasses.¹ The carbonized cereals from Ohalo II support the interpretation that the well-documented presence of Cerealia in pollen profiles from the same time (Tsukada in van Zeist and Bottema 1982, Leroi-Gourhan and Dar-

1. Other plant remains from Ohalo II include edible wild fruits (*Amygdalus* sp., *Crataegus* sp., *Nitraria schoberi* L., *Olea europaea* L., *Pistacia atlantica* Desfontaines, cf. *Pyrus syriaca* Boissier, *Quercus* sp., *Vitis vinifera* L., *Ziziphus spina-christi* [L.] Desfontaines), other edible wild plants (*Atriplex* sect. *Rosa*), *Chenopodiaceae*, *Erodium* sp., *Lens* sp., *Malva* sp., *Scirpus littoralis* Schrader, *Suaeda* sp., *Viciae*, and other wild plants (*Arundo/Phragmites*, *Chara* spp., *Galiom* sect. *Kolgyda*, *Hippocrepis* sp., *Potamogeton* sp., *Potamogeton pectinatus* L., *Styrax officinalis* L., *Umbelliferae*, unidentified).

mon 1991) reflects the presence of collectible cereals in the Mediterranean Levant. In addition, this evidence unequivocally supports Flannery's (1969) contention that the "broad-spectrum revolution," in which hunter-gatherers acquired and consumed numerous and diverse resources, had begun by the Late Palaeolithic in the Levant. It therefore seems inconceivable that the Natufians—7,000 years later—ignored an important and abundant resource that could be easily collected along both sides of the Jordan Valley or around the Damascus basin, which accommodated a large lake at the time (van Zeist and Bakker-Heeres 1979). Regrettably, there are few or no floral remains from most Natufian sites. This is due not to poor recovery techniques or inadequate research design but to the fact that most of the excavated Natufian sites are embedded in terra rossa Mediterranean soils, which are wet in winter and dry in summer. In these conditions, more recent plant remains often sink along with small artifacts and even small sherds. Until Natufian sites are excavated on a large scale where the deposits allow better preservation (for example, in the Lower Jordan Valley), we must rely on the diverse plant collections from Ohalo II and the Epipalaeolithic levels at Abu Hureyra I (Moore 1991, Hillman, Colledge, and Harris 1989, Moore and Hillman 1992).

Secondly, despite the debate concerning the use of mortars and pestles as well as sickle blades, at least the latter can be considered as supporting evidence for the harvesting of cereals. Sickle blades are a Natufian invention and are present in many sites within the Natufian heartland, although there are far fewer in sites north of the Damascus basin, such as Abu Hureyra I and Mureybet (Unger-Hamilton 1989). Natufian sickle blades bear the kind of polish that has been shown in experimental work to be created by cutting highly siliceous cereal stems and not other kinds of plants (Unger-Hamilton 1989, 1991; Anderson 1991). Indeed, it is worth noting that Garrod (1932) originally assumed that the Natufians were the first farmers on the basis of these sickle blades.

Finally, isotopic data also indicate high levels of cereal consumption during the Early Natufian. Sillen and Lee-Thorpe (1991) demonstrated that Early Natufian populations have high strontium/calcium ratios (indicating cereal-rich diets) comparable to those of Early Neolithic farming populations. Such ratios would not be a consequence of heavy consumption of acorns, as suggested by Moore (1991 and CA 35:49); although acorns may have been harvested they were more likely a famine food, being low in nutritional value and difficult to process (Renfrew 1973; McCorriston 1992, n.d.).

The recent contention by researchers such as Moore (1993) and Olszewski (1993) that the Natufians did not gather cereals seems to reflect a desire to see agriculture as arising *de novo* out of climatic stress rather than as an intensification of subsistence strategies that had deep roots in the Levantine Epipalaeolithic. A more plausible explanation is that the harsher conditions imposed by the Younger Dryas led to the intentional cultivation of the same cereals that were previously harvested in wild

stands (Bar-Yosef and Belfer-Cohen 1989, Bar-Yosef and Meadow n.d.). The shift in subsistence strategies inevitably led to a shift in settlement pattern and an increase in site size clearly expressed by Early Pre-Pottery Neolithic A settlements such as Jericho, Netiv Hagdud, and Gilgal. Obtaining evidence for seasonality as reflected in the cementum increments of gazelles and other animals remains essential for testing the various hypotheses concerning the importance of site occupations at the origins of agriculture.

References Cited

- ANDERSON, P. 1991. "Harvesting of wild cereals during the Natufian as seen from the experimental cultivation and harvest of wild einkorn wheat and microwear analysis of stone tools," in *The Natufian culture in the Levant*. Edited by O. Bar-Yosef and F. R. Valla, pp. 521–56. Ann Arbor: International Monographs in Prehistory.
- BAHARAV, D. 1981. Food habits of the mountain gazelle in semi-arid habitats of eastern Lower Galilee, Israel. *Journal of Arid Environments* 4:63–69.
- . 1983. Observation on the ecology of the mountain gazelle in the Upper Galilee, Israel. *Mammalia* 47:59–69.
- BAR-YOSEF, O., AND A. BELFER-COHEN. 1989. The origins of sedentism and farming communities in the Levant. *Journal of World Prehistory* 4:447–98.
- BAR-YOSEF, O., AND R. MEADOW. n.d. The origins of agriculture in the Near East. MS, School of American Research, Santa Fe, N.M.
- BATE, D. M. A. 1937. "Palaeontology: The fossil fauna of the Wady el-Mughara Caves," in *The Stone Age of Mount Carmel*, vol. 1, by D. A. E. Garrod and D. M. A. Bate, pp. 135–233. Oxford: Clarendon Press.
- COPE, C. 1991. "Gazelle hunting strategies in the southern Levant," in *The Natufian culture in the Levant*. Edited by O. Bar-Yosef and F. R. Valla, pp. 341–58. Ann Arbor: International Monographs in Prehistory.
- FLANNERY, K. 1969. "Origins and ecological effects of early domestication in Iran and the Near East," in *The domestication of plants and animals*. Edited by P. J. Ucko and T. W. Dimbleby, pp. 73–100. London: Duckworth.
- GARRARD, A. 1980. Man-animal-plant relationships during the Upper Pleistocene and Early Holocene of the Levant. Ph.D. diss., University of Cambridge, Cambridge, England.
- . 1982. "The environmental implications of the re-analysis of the large mammal fauna from the Wadi el-Mughara Caves, Palestine," in *Paleoclimates, paleoenvironments, and human communities in the eastern Mediterranean region in later prehistory*. Edited by J. L. Bintliff and W. van Zeist, pp. 165–98. British Archaeological Reports International Series 133.
- . 1984. "Community ecology and Pleistocene extinctions in the Levant," in *Hominid evolution and community ecology*. Edited by R. Foley, pp. 261–77. London: Academic Press.
- GARROD, D. A. E. 1932. A new Mesolithic industry: The Natufian of Palestine. *Journal of the Royal Anthropological Society* 62:257–69.
- HIETALA, H. J., AND D. S. STEVENS. 1977. Spatial analysis: Multiple procedures in pattern recognition. *American Antiquity* 42:539–59.
- HILLMAN, G. C., S. M. COLLEDGE, AND D. R. HARRIS. 1989. "Plant-food economy during the Epipalaeolithic period at Tell Abu Hureyra, Syria: Dietary diversity, seasonality, and modes of exploitation," in *Foraging and farming: The evolution of plant exploitation*. Edited by D. R. Harris and G. C. Hillman, pp. 240–68. London: Unwin Hyman.
- HILLMAN, G. C., AND M. E. DAVIES. 1990. Measured domestication rates in wild wheats and barley under primitive cultivation and their archaeological implications. *Journal of World Prehistory* 4:157–222.

- HOOIJER, D. A. 1961. The faunal vertebrates of Ksâr 'Akil, a Palaeolithic rock shelter in the Lebanon. *Zoologische Verhandlungen: Uitgegeven door het Rijksmuseum van Natuurlijke Historie te Leiden* 49:1-68.
- KISLEV, M. 1989. "Pre-domesticated cereals in the Pre-Pottery Neolithic A period," in *People and culture change*. Edited by I. Hershkovitz, pp. 147-52. *British Archaeological Reports International Series* 508.
- . 1992. "Agriculture in the Near East in the VIIth millennium B.C.," in *Préhistoire de l'agriculture*. Edited by P. C. Andersen, pp. 87-93. *Monographie du CRA* 6.
- KISLEV, M., D. NADEL, AND I. CARMI. 1992. Epi-Palaeolithic (19,000 BP) cereal and fruit diet at Ohalo II, Sea of Galilee, Israel. *Review of Palaeobotany and Palynology* 71:161-66.
- LEROI-GOURHAN, A., AND F. DARMON. 1991. "Analyses polliniques de stations Natoufiennes au Proche-Orient," in *The Natufian culture in the Levant*. Edited by O. Bar-Yosef and F. R. Valla, pp. 21-6. *Ann Arbor: International Monographs in Prehistory*.
- LIEBERMAN, DANIEL E. 1993a. The rise and fall of seasonal mobility among hunter-gatherers: The case of the southern Levant. *CURRENT ANTHROPOLOGY* 34:599-631.
- . 1993b. "Variability in hunter-gatherer seasonal mobility in the southern Levant: From the Mousterian to the Natufian," in *Hunting and animal exploitation in the Later Palaeolithic and Mesolithic of Eurasia*. Edited by G. Peterkin, H. Bricker, and P. Mellars, pp. 207-19. Washington, D.C.: Archaeological Papers of the American Anthropological Association.
- MC CORRISTON, J. 1992. Vegetational dynamics and aboriginal ecologies in Alta California, Ph.D. diss., Yale University, New Haven, Conn.
- . n.d. Acorn eating and agricultural origins: California ethnographies and analogy in the Near East. *Antiquity*. In press.
- MILLER, N. F. 1992. "The origins of plant cultivation in the Near East," in *The origins of agriculture*. Edited by C. W. Cowan and P. J. Watson, pp. 39-58. Washington, D.C.: Smithsonian Institution Press.
- MOORE, A. M. T. 1991. "Abu Hureyra I and the antecedents of agriculture on the Middle Euphrates," in *The Natufian culture in the Levant*. Edited by O. Bar-Yosef and F. R. Valla, pp. 277-94. *Ann Arbor: International Monographs in Prehistory*.
- . 1993. On seasonal mobility and agriculture in the Levant. *CURRENT ANTHROPOLOGY* 35:48-49.
- MOORE, A. M. T., AND G. C. HILLMAN. 1992. The Pleistocene to Holocene transition and human economy in Southwest Asia: The impact of the Younger Dryas. *American Antiquity* 57:482-94.
- NADEL, D., AND I. HERSHKOVITZ. 1991. New subsistence data and human remains from the earliest Levantine Epipalaeolithic. *CURRENT ANTHROPOLOGY* 32:631-35.
- OLSZEWSKI, DEBORAH I. 1993. Subsistence ecology in the Mediterranean forest: Implications for the origins of cultivation in the Epipalaeolithic southern Levant. *American Anthropologist* 95:420-35.
- RENFREW, J. 1973. *Palaeoethnobotany*. New York: Columbia University Press.
- SILLEN, A., AND J. LEE-THORPE. 1991. "Dietary change in the Late Natufian," in *The Natufian culture in the Levant*. Edited by O. Bar-Yosef and F. R. Valla, pp. 399-410. *Ann Arbor: International Monographs in Prehistory*.
- TCHERNOV, EITAN. 1988. "The palaeobiological history of the southern Levant," in *The zoogeography of Israel*. Edited by Y. Yom Tov and E. Tchernov, pp. 159-250. Dordrecht: W. Junk.
- . 1991. "Biological evidence for human sedentism in southwest Asia during the Natufian," in *The Natufian culture in the Levant*. Edited by O. Bar-Yosef and F. R. Valla, pp. 315-40. *Ann Arbor: International Monographs in Prehistory*.
- . 1992. The Afro-Arabian component in the Levantine mammalian fauna: A short biogeographical review. *Israel Journal of Zoology* 38:155-92.
- UNGER-HAMILTON, R. 1989. The Epi-Palaeolithic southern Levant and the origins of cultivation. *CURRENT ANTHROPOLOGY* 30:88-103.
- . 1991. "Natufian plant husbandry in the southern Levant and comparison with that of the Neolithic periods: The lithic perspective," in *The Natufian culture in the Levant*. Edited by O. Bar-Yosef and F. R. Valla, pp. 483-520. *Ann Arbor: International Monographs in Prehistory*.
- VAN ZEIST, W., AND J. A. H. BAKKER-HEERES. 1982. Archaeobotanical studies in the Levant: Neolithic sites in the Damascus Basin—Aswad, Ghoriáfé, Ramad. *Palaeohistorica* 24:165-256.
- VAN ZEIST, W., AND S. BOTTEMA. 1982. "Vegetational history of the Eastern Mediterranean and the Near East during the last 20,000 years," in *Paleoclimates, palaeoenvironments, and human communities in the eastern Mediterranean region in later prehistory*. Edited by J. L. Bintliff and W. van Zeist, pp. 277-323. *British Archaeological Reports International Series* 133[1].
- . 1991. *Late Quaternary vegetation of the Near East*. Weisbaden: Ludwig Reichert Verlag.
- WEINSTEIN-EVRON, M. 1990. Palynological history of the last pleniglacial in the Levant. *Etudes et Recherches Archéologiques de l'Université de Liège* 42:9-25.
- ZOHARY, M. 1992. "Domestication of the Neolithic Near East crop assemblage," in *Préhistoire de l'agriculture*. Edited by P. L. Andersen, pp. 81-86. *Monographie du CRA* 6.
- ZOHARY, M., AND M. HOPF. 1988. *The domestication of plants in the Old World*. Oxford: Oxford University Press.

On Demography and Social Structure

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In the late seventies and especially the eighties, anthropology began to be strongly influenced by demography or, more precisely, stable population theory. The underlying objective, however, was not to reduce anthropology to statistical demography but to understand the demographic variables leading to changes in facets of the social structure (organization) of preindustrial societies (see, e.g., Buchler and Selby 1968 and Srivastava 1975). Martin's remarkable paper (CA 35:255-80) makes a strong case for such conditions in a Southwestern American community.

Havasupai women's status, as reflected in their domestic decision-making power, economic role, legal rights, education, health, employment, etc., affects demographic behavior such as fertility, sex ratio, mortality, age at marriage, and birth interval, among others. These in turn have an impact on the improvement of women's status and their participation in the development process. Because categories overlap, it is not easy to determine which variable has the greatest effect. They are distinguishable from one another primarily by difference in emphasis. The approach developed by Martin is important in that it not only points to the ways in which the sex ratio varies over time but also emphasizes that consideration of socio-biological categories is absolutely essential if we are to go beyond the structural description of a society.