

BOOK REVIEWS

The Quaternary of Israel. Aharon Horowitz. Academic Press, New York/London, 394 pp., 1979. (With contributions by B. Arensburg, O. Bar-Yosef, R. Gophna, E. Mintz, James L. Phillips, Y. Rak, A. Ronen, E. Tchernov, John C. Vogel, and M. Weinstein.)

Horowitz points out that "Israel's unique geographic situation on the juxtaposition of three continents makes the region important," and Tchernov echoes this opinion in stating that "Israel stands at a biogeographical crossroads during the Neogene and Pleistocene periods." The geological history of the country thus involves very interesting liaisons between East and West and between the temperate and subtropical climatic belts. The "crossroads" are all the more narrow because the more favorable land for man and beast is constricted between the sea and the desert. Given this perspective, it is not easy to condone the strongly lococentric, or even egocentric, view of global Quaternary events and chronology presented by Horowitz.

Much credit must be given to Horowitz, nevertheless, for an outstanding paleogeographic synthesis, showing his understanding of the various aspects of bedrock geology, geomorphology, regional and local tectonics, and paleoclimates. These elements have been brought together to produce a very useful source book on the geological evolution of Israel over the past few million years.

The structure of the volume flows smoothly from an introduction to the present-day setting of the country, through the structural and tectonic developments, into a lengthy description of the Quaternary stratigraphy (Chap. 5) covering marine, littoral and coastal plain, fluvial, lacustrine, eolian, and volcanic settings. This is followed by three chapters on specialized aspects of Quaternary studies: palynology, mostly Horowitz' own work; Quaternary faunas by E. Tchernov; anthropology from fossil man to early agriculture written by Horowitz' colleagues, B. Arensburg, O. Bar-Yosef, E. Mintz, A. Ronen, J. L. Phillips, R. Gophna, and Y. Rak. Horowitz concludes with an excellent summary chapter (25 pages) that really wraps it all up, providing a rapid review of nearly all the major points discussed in the book.

The bibliography is extensive, with some 700 entries, but only 25 of these date from 1977 and only one (an abstract by Horowitz) from 1978. Amazingly absent from the bibliography are recent publications on global Quaternary stratigraphy, even of papers earlier than 1977. Crucial papers are missing, although they

are widely known to workers around the world, for example, Butzer's (1975) and Sanlaville's (1977) detailed works on Mediterranean shorelines, Kukla's (1977) analysis of the problems with European, especially Alpine, glacial chronology, and everything on deep-sea chronology and CLIMAP.

When Horowitz begins to relate events in Israel with those beyond the shores of that country, the informed reader is shocked at the author's antiquated stratigraphic framework, especially

a. a "Preglacial Pleistocene" and a "Glacial Pleistocene," the latter beginning about 1.7 million years ago;

b. a Glacial Pleistocene comprising four glaciations, the Günz, Mindel, Riss, and Würm, some of these glaciations lasting as long as 300,000 to 600,000 years each;

c. explicit acceptance of the glacial = pluvial equation;

d. an altimetric correlation of Mediterranean shorelines, although somewhat disguised;

e. revival of the long-discredited term "Monastirian."

The concept of a "Preglacial Pleistocene" certainly does not make much sense in a world where there is solid evidence of continental and mountain glaciation around the world 3 to 3.5 million years ago.

Many of us have decried the use of the Alpine terminology anywhere outside the Alps, even if it were correctly conceived in its type area. Horowitz does not seem aware of the difficulties in the Alpine chronology, clearly pointed out by Kukla (1977) and others. Horowitz would begin the Günz Glaciation about 1.7 million years ago, although paleomagnetic control in the Alps would make it not much older than 0.9 million years. In addition, he would have only four (Alpine) glacials in the span of time known from deep-sea core study to have included some 17 or 18 full glacial-interglacial cycles. Finally, his interglacials ("interpluvials"), to which he applies Mediterranean sea-level terms, last for as much as 300,000 years in contrast to the much shorter non-glacial episodes shown in deep-sea cores.

Not only does Horowitz persistently write about the "Günzian" sediments of Erk el-Ahmar and the "Würmian Lisan Formation," etc., but he also uses dates derived from Israeli phenomena to date Alpine events. This practice clearly can only lead to increased confusion in the stratigraphic literature. For example, on p. 169 Horowitz states unequivocally that "the dates for the Cover Basalt give a maximum age for the Günzian, which overlies the Cover Basalt. . . ." In reality,

of course, the K/Ar dates for the Cover Basalt provide limiting dates for the Gadot–Hazor formations, which can be related to the Günz glaciation of the Alps only tenuously and by tortuous reasoning.

It is only for the last glacial cycle (“Würmian”) that the correspondences between Israeli pluvials and interstadials with the European glacials and interstadials can be tested. Unfortunately, Horowitz’ subdivisions do not match well with published European sequences, a conspicuous example being his “Middle–Late Würm Interstadial” between 20,000–22,000 and 16,000–18,000 B.P. and controlled primarily by a ¹⁴C date of 18,800 B.P. in the Hula K-Jam borehole. This “interstadial” straddles the time of the maximum glacial advance in Europe and North America, the 18,000 B.P. datum of the CLIMAP program, and “polar desert” conditions in the Netherlands.

At the outset Horowitz (p. 7) states that he will retain Depéret’s (1918) terminology, which he says is “now widely accepted,” although he admits some altitudinal and faunal problems. Implicit in Horowitz’ usage is an acceptance of the old “altimetric correlation” scheme, nonetheless. Accepting this scheme of eustatic levels, Horowitz infers little or no tectonic activity south of the Haifa Bay during the “Glacial Pleistocene.” He is thus led to the conception (and definition) of the Quaternary as one mega-eustatic cycle from the Pliocene minimum sea level to the Calabrian maximum, 120 m above present sea level, followed by oscillating regression down to the present-day sea level.

Tectonic stability in coastal Israel is in fact refuted by other phenomena discussed by Horowitz. According to Horowitz, the Jordan–Dead Sea rifting occurred without any appreciable effect on the coastal plain area, only a few tens of kilometers to the west. It is difficult to understand how the coastal area could have been uncoupled from the strong rifting movements.

In trying to summarize the value of this book, this reviewer is sorely perplexed. Horowitz has ably succeeded in summarizing and synthesizing the local late Cenozoic geology of this small but crucial country. Its marine, tectonic, and volcanic phenomena provide ample opportunities for correlation with other areas of the world, and its location at the “crossroads” of three continents is perhaps unique for an area so rich in its Quaternary record. However, Horowitz ignores completely the relations with surrounding countries of the Levant, and he fails abysmally in correlating the Quaternary of Israel to the rest of the world. He has missed a golden opportunity because his stratigraphic scheme is both anachronistic and faulty. It will serve only to compound the confusion already rampant in Quaternary stratigraphic literature.

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Quaternaire et Préhistoire du Nahr el Kébir Septentrional (Les Débuts de l’Occupation Humaine dans la Syrie du Nord et au Levant). Paul Sanlaville, Lorraine Copeland, Francis Hours, and Jacques Besançon. Collection de la Maison de l’Orient Méditerranéen, No. 9; Série Géographique et Préhistorique no. 1; Editions du Centre National de la Recherche Scientifique, Paris, 161 pp. including a 10 pp. English summary.

The team of Sanlaville and Besançon (geomorphologists) and Copeland and Hours (prehistorians) has already made its mark on the Quaternary literature of the Levant, especially on that of Lebanon. Here they have concentrated their efforts on a small, but extremely interesting area, perhaps unique along the Near Eastern coast in its combination of fluvial as well as marine terraces and richness in archaeological remains. The Nahr el Kébir Septentrional (literally the “northern big stream valley”) is a relatively small drainage heading in the coastal mountains of northwesternmost Syria and debouching into the Mediterranean at Lattakia, and not be confused with the Nahr el Kébir Méridional that marks the Syro-Lebanese border about 100 km to the south. The lower alluvial valley of the Nahr el Kébir Septentrional is quite broad (up to 6 km) and forms a natural passage to the interior, the Ghab depression and the Syrian Desert. Judging by the abundance of artifacts this passage must have been as attractive in prehistoric times as it has been in Classic and historic periods.

The area investigated by Sanlaville and colleagues is only about 15 by 15 km square, but it includes a wealth of landforms and stratigraphic exposures that allow the authors to “define early, middle, late and final Acheulean” industries within a “solid chronostratigraphic framework.” As it turns out, the relative chronology appears to be well established, but the absolute age of the industries and their correlations beyond the local area are tenuous.

Most of the work reported here was carried out in a single field season (1976), and the geomorphic, sedimentological, and stratigraphic observations are based on field observations unsupported by laboratory analyses. Nevertheless, the previous experience of this team in neighboring areas lends a strong degree of confidence in their interpretations.

This volume is organized into three parts. In the first part Sanlaville presents the general geographic and bedrock setting of the area and then elaborates on the occurrence of marine terraces and fluvial formations. A widely represented fossiliferous sandstone and conglomerate flanking an old sea cliff at 80–85 m above sea level is the dominant marine feature. The Enean (Tyrrhenian) shoreline of the last interglacial is lacking locally, but from its known altitude in nearby areas and from comparisons with the Jbailian transgression in Lebanon, Sanlaville correlates the 80- to 85-m shoreline with the penultimate interglacial, or with the Mindel/Riss of the Alps. The altitude of this shoreline suggests considerable epeirogenic uplift of the Le-