culture in different parts of France contains 16 papers on the Neolithic, 17 on the Bronze Age, and 17 on the Iron Age. Like Vol. I, Vol. II is concluded by an appendix with radiocarbon dates, this time for Holocene deposits and sites.

The range of topics covered in *La Préhistoire Française* is so great that it's unlikely any single reviewer could judge the volumes' overall success. It is perhaps nearly as unlikely that any single person will ever read both volumes from cover to cover. The present reviewer focused on articles in his speciality, Pleistocene archeology and mammalian paleontology, and found the overwhelming majority of them to be exceedingly useful. Generally speaking, they were clearly written, well illustrated, and well referenced. As a basic source book on French Quaternary studies, *La Préhistoire Française* has no rivals, and there is nothing like it for any other country, including East European ones, where more centralized organization of science should in theory make such works easier to produce than in France. *La Préhistoire Française* then is testimony not only to the remarkable achievements and vitality of French Quaternary science, but to the extraordinary willingness of its practitioners to cooperate in setting forth the state of their art.

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Géomorphologie et Préhistoire dans la Région de Strasbourg: Recherches Géographiques, à Strasbourg, No. 7. Edited by H. Vogt. Association Géographique d'Alsace, U.E.R. de Géographie, Université L. Pasteur, Strasbourg, France, 1978, 180 pp.

Strasbourg sits right in the middle of the Rhine Graben, that classic rift valley, and right in the midst of extensive fluvial terraces and loess deposits that provide a very complete record of Quaternary events from "Mindelian" times onward. Moreover, Strasbourg is the seat of one of the most prominent provincial universities in France, one which, while suffering the vicissitudes of alternation of national allegiance between France and Germany, has profited from the best of academic traditions from both sides of the Rhine.

The papers in the present volume continue this tradition and are worthy of it. They center on Quaternary tectonics of the Rhine Graben and on the alluvial fill and loessic cover. This volume is the latest in a series of publications by the Institut de Géographie at the University of Strasbourg, a series that covers geomorphology, physical and human geography, climatology, and cartography. This tome is paperbound, offset from typescript copy, but easily legible, well edited, and adequately illustrated. Most of the figures are line drawings, but there are a few halftones (of fossil bones and photomicrographs) which are of acceptable quality.

Although this is a very valuable group of papers, the volume is likely to be primarily utilized by local Rhine valley geologists and prehistorians and a small number of specialists who are concerned with European loess stratigraphy. The major reason for this limitation is the lack of any effort on the part of the editor or the authors to present a synthesis or summary of their research. There is not so much as a preface, foreword, introduction, or abstract to the volume as a whole, and no summary or conclusions at the end. Therefore, the integration of the findings of the various papers is to a great extent left up to the reader. Moreover, given the wealth of local details, references to numerous minor geographic localities, and the inclusion of several papers of distinctly provincial interest, this is definitely not a convenient arrangement.

The volume opens with a contribution by the editor, H. Vogt, who plunges right into a very detailed description of a number of geomorphic features indicative of the neotectonics of the Strasbourg area. The main Rhine Graben faults of Tertiary age appear not to have been active during the Quaternary. However, the floor of the graben has been strongly compartmentalized by a swarm of faults active into late Quaternary time. One of Vogt's main points concerns the eastward shifting of downfaulting, since "Mindel" times at least, such that the present course of the Rhine now lies closer to the German Black Forest than to the slopes of the French Vosges. Moreover, this continued subsidence of the graben floor brought about a number of drops in local base level, leading in turn to erosional incision and removal of early and middle Quaternary deposits of the area.

The main impact of this volume—125 of some 170 pages of text—concerns the famous areas of Achenheim and Hangenbieten just west of Strasbourg. Loess quarries here have yielded numerous animal fossils as well as occasional human artifacts, collected and reported on for nearly a century. In 1957 Paul Wernert published his dissertation on the stratigraphy, fossils, and artifacts of Achenheim–Hangenbieten, essentially closing the book on the subject—or at least it seemed so. In brief, the stratigraphic succession begins with gray, calcareous Rhine alluvium mainly of Alpine origin overlain by reddish-brown alluvium of local (Vosgian) origin, all capped by a thick succession of loesses (*loess anciens* and *loess récents*) that contains important paleosols as well as abundant evidence of periglacial activity. The loess blanket, up to 35 m thick on the foothills just northwest of Strasbourg, forms a deceptively uniform surface, masking the tectonic complexity mentioned above. The Rhine alluvium immediately below the loess is considered to be of "Mindel" age on the basis of its vertebrate fossils.

In recent years, however, new questions have been

asked, and a variety of investigators from several countries have begun to probe into different aspects of Achenheim–Hangenbieten stratigraphy. As they did so it became evident that it was not always easy to situate the new results relative to those of Wernert. Wernert's published sections were to some extent synthetic composites and, moreover, many of his outcrops no longer exist because of continued working of the quarries. Thus, in this volume A. Thévenin has made a major contribution by putting together a realistic, three-dimensional framework (Figure A in the publication) of the half dozen adjacent quarries in their present state. Within this framework Wernert's sections as well as the observations of modern contributors have been related in a meaningful way.

Perhaps the three most important contributions in this volume are those dealing with the sedimentology of the deposits (J. Fouquoire), with the molluscan fauna (J-J. Puisségur), and with an archeological site discovered in 1974 (A. Thévenin and colleagues). Fouquoire's detailed sections and observations on granulometry, mineralogy, and paleopedology were sorely needed in order to answer questions concerning primary and reworked loess and the importance of certain paleosols. He claims recognition of Mindel/Riss, Riss/Würm, and Stillfried-A paleosols, as well as humic horizons perhaps equivalent to Stillfried-B of the central European sequence. Puisségur's study of the snails is particularly welcome in light of his recent dissertation on the Quaternary malacofauna of Burgundy. On the basis of extensive sampling at Achenheim and the ecological requirements of the mollusks, he has drawn paleoclimatic curves encompassing the time from "Riss I" (*loess ancien inférieur*) into the Holocene. Both Fouquoire's and Puisségur's sections are given in great detail, but unfortunately the correlation between their sections is once more left to the reader. It seems that the editor and authors have missed a great opportunity to present a really integrated study of these deposits.

The archeological site, *Sol 74*, is interpreted as a butchering station and is dated to the early Würm on the basis of the fauna: *Coelodonta antiquitatis, Equus caballus germanicus, Mammuthus primigenius, Megaceros giganteus*. The artifacts, on the other hand, appear archaic, but this is attributed to the poor quality of raw material available locally, rather than to their antiquity. The site was carefully excavated and the results are presented by means of sections and maps of artifact-and-bone distributions, as well as drawings of the artifacts.

The volume is rounded out with detailed contributions on fossils from the older Rhine Alluvium (F. Geissert), sedimentology of the *sables rouges* (J. Marnot-Houdayer), micromorphology of cryoturbated loess (T. Vogt), and the question of the origin of the fine-grained gray sands of early Quaternary age (F. Geissert *et al.*). There is an integrated bibliography at the end of the volume, which will be very useful to future researchers, but it is by no means complete. Each article is preceded by an abstract in French, English, and German. Other works on clay mineralogy, on deep borings that may penetrate back to "Cromerian" levels, and on the malacofauna of nearby Hangenbieten are mentioned as being in progress.

It has long been realized that the loess deposits of the Strasbourg area represent an important transition between loess of the maritime Paris Basin, on one hand, and the dry loess area of Austria and Czechoslovakia on the other. Moreover, the Alsatian deposits are particularly critical because of their fossil content. Puisségur believes they are "unique in France" by virtue of the fact that they yield fossils from nearly every level. This volume, therefore, will be very useful to Quaternary biostratigraphers and to those interested in the paleoclimatic framework of Europe. However, the failure of the editor and authors to integrate their results in a meaningful way (no introduction, no summary) effectively means that this book will be utilized only by specialists.

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