

State of Research on the Quarternary of the Federal Republic of Germany

by K.-E. BEHRE, K. DUPHORN, B. FRENZEL, H. GRAUL, F. GRUBE, J. LÜNING, B. MENKE,
K.-D. MEYER, H. REMY, W. SCHIRMER, H. SCHWABEDISSEN, A. SEMMEL, H. STREIF,
and R. VINKEN

Sponsored by Deutsche Forschungsgemeinschaft, Bonn - Bad Godesberg

Editors: E. SCHÖNHALS and R. HUCKRIEDE

	page
Contents	
Preface of the editors	219—221
A. Area of Scandinavian Glaciation	
1. Pleistocene and Holocene by KLAUS DUPHORN, FRIEDRICH GRUBE, KLAUS-DIETER MEYER, HANSJÖRG STREIF, and RENIER VINKEN	222—250
2. History of Vegetation and Biostratigraphy by BURKHARD MENKE and KARL-ERNST BEHRE	251—267
B. Foreland of the Alps	
1. Lithostratigraphy, Palaeopedology and Geomorphology by HANS GRAUL	268—280
2. Some Remarks on the Pleistocene Vegetation by BURKHARD FRENZEL	281—292
C. Area between the Scandinavian and the Alpine Glaciation	
1. Periglacial Sediments and their Stratigraphy by ARNO SEMMEL	293—305
2. The Holocene of the Former Periglacial Areas by WOLFGANG SCHIRMER	306—320
3. On the Pleistocene Vegetation History by BURKHARD FRENZEL	321—332
D. Palaeozoological Research by HORST REMY	333—339
E. Archaeological Research	
1. Palaeolithic and Mesolithic Periods by HERMANN SCHWABEDISSEN	340—359
2. Neolithic Periods by JENS LÜNING	360—370

Preface

Nowhere else in Europe is Quaternary research so much favoured by topographical situation and geological features as in Germany. This country includes parts of two separate areas of Pleistocene glaciation that of the vast Scandinavian Glaciation and that of the Alps.

Fortunate circumstances exist in the North:

Here are the fringes of the sea, and climate-controlled eustatic transgressions and regressions are in correlation with various non-marine deposits, either of interglacial or Holocene or glacial nature. In this northern region German research has for a long time been in close partnership with congenial Quaternary scholars of several nations bordering the North-Sea and Baltic.

In the South Germany possesses an area, which in former decades was regarded as the most "classical" region of Ice Age stratigraphy: the Alpine Foreland. Here large alpine glaciers repeatedly found their entry, advanced and retreated. Although many scholars lay stress upon a priority or superiority of the Scandinavian Glaciation Area for international stratigraphic decisions, the research on Alpine Glaciation is of great consequence for a multiplicity of geological problems in Middle and Southeast Europe as well as in the mediterranean areas.

Both the areas of Pleistocene glaciation are separated (and connected) by a broad belt of varied morphological character. Mountainous regions vary with basins and valleys or are interrupted by them. Blocks still in tectonic uplifting border on areas of predominant subsidence. Old landsurfaces (with all their possibilities to preserve remnants of past periods) neighbour on areas of rather continual or temporary accumulation. Pliocene and Quaternary tectonic movements play a role in certain regions. Basins may be caused by subsolution of Permian salinar rocks.

It is easy to understand that a multitude of different kind of deposits and geomorphological details are to be found in this middle part of Germany and that diverse fossil faunas and floras are preserved. Since it is a part of the former periglacial belt and situated in the broad zone of loess which stretches from France to Southeast Europe, it is not to be wondered at, that loess, solifluction sheets and all events concerning cold ages are of main interest, also the problems of local glaciation.

An enormous help to date and correlate fluvial, aeolian and peaty deposits are the different kinds of volcanites of the Middle Rhine region. Some of the tuffs have a wide range throughout Middle Europe.

For the knowledge of Holocene stratigraphy and vegetation history the large bogs and fens of Northern Germany and of the Alpine Foreland are of great importance.

There is still another fact that contributes to the vivid picture of German Pleistocene and Holocene: over Germany the oceanic type of climate changes to a more continental one, and so it has been during most of the past Quaternary periods.

Favourable for Quaternary research are the large rivers flowing from the South to the North. Their terrace systems connect the former periglacial area with the former glaciated one in the North. The river Rhine even traverses Germany from the Alps to the Northwestern glaciation area, but it very much looks as if the Rhine Graben more impedes than promotes the efforts to correlate the Alpine and Northwestern Glaciation areas.

It is known even to non-Europeans that it was in German regions where decades ago the first general stratigraphical subdivisions of the Ice Age were achieved (PENCK &

BRÜCKNER, SOERGEL, EBERL, Preußische Geologische Landesanstalt) subdivisions still today applied the world over.

Finds of artifacts make it certain that man lived in Germany since Abbevillian times. Perhaps he roamed over Germany still earlier, in pre-Abbevillian periods. There are magnificent artifacts of Older and Middle Palaeolithic that do not rank below the classical ones of Western Europe. Early in palaeoanthropological research Germany contributed to international science *Homo neanderthalensis*, *Homo heidelbergensis* and *Homo steinheimensis*. Germany has been settled by agriculturalists since the fifth millenium B.C. Prehistory is in Germany an important part of Quaternary research and often is a great help to date and characterise natural events.

In the last 1—2 decades so many important Quaternary results have been attained in Germany (especially in loess investigations, palaeopedology, palynology, prehistory, and radiocarbon dating) that it seems desirable to summarize and outline the state of knowledge and present it to the German as well as the foreign Quaternary investigator. Regrettable reasons well known to the reader, force us to give a summary on only a part of Germany: the Federal Republic. We give this short account, although we are conscious that in several fields of research great gaps are still to be filled, still many problems await solution, for instance in palaeomagnetism, Older Pleistocene and the passage from the Pliocene, and in the knowledge on Pleistocene tectonic.

We have been fortunate in securing for this account the co-operation of several of the most competent and active Quaternary scholars. They all have endeavoured to preserve a balance of the various aspects, fields, and areas of research, but nevertheless in some cases it was not to be avoided that out of the abundance of the heart the special fields of interest are given some preference and others are slightly neglected.

Much of our scientific progress only could be attained by the stimulating contacts with the Quaternary scholars of the neighbouring countries. The more it is regrettable that such an exchange of thoughts and experience is not yet possible with many of our German colleagues.

Gießen and Marburg
September 11, 1973

E. SCHÖNHALS
R. HUCKRIEDE
Editors