



Universiteit
Leiden
The Netherlands

The Rhine/Meuse Delta: four studies on its prehistoric occupation and holocene geology

Louwe Kooijmans, L.P.; Knip, A.S.

Citation

Louwe Kooijmans, L. P., & Knip, A. S. (1974). The Rhine/Meuse Delta: four studies on its prehistoric occupation and holocene geology. *Analecta Praehistorica Leidensia* VII, 7, 28. Retrieved from <https://hdl.handle.net/1887/28080>

Version: Not Applicable (or Unknown)

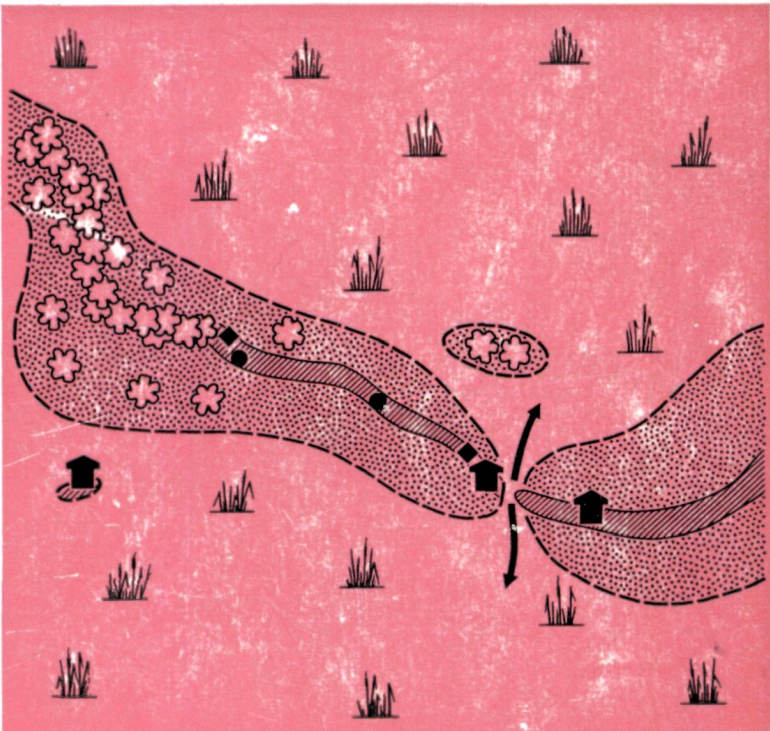
License: [Leiden University Non-exclusive license](#)

Downloaded from: <https://hdl.handle.net/1887/28080>

Note: To cite this publication please use the final published version (if applicable).

ANALECTA PRAEHISTORICA LEIDENSIA

1974



VII

RIJKSUNIVERSITEIT LEIDEN



1 094 604 9

000-136b





ANALECTA PRAEHISTORICA LEIDENSIA

VII

ANALECTA PRAEHISTORICA
LEIDENSIA
VII

PUBLICATIONS OF THE INSTITUTE OF PREHISTORY
UNIVERSITY OF LEIDEN

L. P. LOUWE KOOIJMANS

THE RHINE/MEUSE DELTA
FOUR STUDIES ON ITS PREHISTORIC OCCUPATION AND
HOLOCENE GEOLOGY

WITH A CONTRIBUTION BY AGATHA S. KNIP,
LATE NEOLITHIC SKELETON FINDS FROM MOLENAARSGRAAF (Z.H.)



LEIDEN UNIVERSITY PRESS

1974

Appears also as :

Oudheidkundige Mededelingen uit het Rijksmuseum van Oudheden te Leiden LIII-LIV, 1973-'74
and as a doctorate thesis, Leiden, 3 april 1974.



ISBN 90.6021.194.4

TO MY PARENTS
TO HUIB DE KOK



TABLE OF CONTENTS

Foreword	XVII
Acknowledgements	XIX
Abbreviations	XXI
Postscript	XXIII

1. PREHISTORIC INHABITATION AND SEA-LEVEL CHANGES IN THE WESTERN NETHERLANDS

1.1. The History of the Archaeological Enquiry	3
1.1.1. Before 1940	3
1.1.2. After 1940	4
1.2. The Holocene of the Western Netherlands	5
1.2.1. A short outline of its structure	5
1.2.2. Transgression and regression phases	8
1.3. The Determination of Inhabitation and its Periodicity	10
1.3.1. Introduction	10
1.3.2. Some critical remarks on the interpretation of the finds	11
1.4. The Sequence of Inhabitation in the Western Netherlands before the Iron Age	12
1.4.1. The maps	12
1.4.2. Palaeolithic — Middle Neolithic	13
1.4.2.1. The Palaeolithic	13
1.4.2.2. The Early Mesolithic	15
1.4.2.3. The Late Mesolithic	15
1.4.2.4. The Early and Middle Neolithic	17
1.4.3. The Vlaardingen Culture	20
1.4.3.1. Dating, distribution, cultural relations	20
1.4.3.2. The situation of the settlements	23
1.4.3.3. The character of the inhabitation	26
1.4.3.4. Settlement finds of the Battle Axe Culture	26
1.4.3.5. Settlement finds of "Hybrid Beakers"	26
1.4.3.6. Isolated finds	27

1.4.4.	The Bell Beaker and the Barbed Wire Beaker Cultures	27
1.4.4.1.	The Maritime Bell Beaker phase	27
1.4.4.2.	The Veluwe Bell Beaker/Barbed Wire Beaker phase	29
1.4.4.3.	The character of the inhabitation	30
1.4.4.4.	Isolated finds.	30
1.4.5.	The Bronze Age after the Barbed Wire Beaker Culture	31
1.4.5.1.	Introduction	31
1.4.5.2.	The Early Hilversum Culture	31
1.4.5.3.	The Middle Bronze Age	33
1.4.5.4.	The Late Bronze Age	34
1.4.5.5.	The character of the inhabitation	35
1.4.5.6.	Isolated finds	35
1.4.6.	Unreliable and insufficiently dated finds	36
1.4.7.	Some conclusions	36
1.4.7.1.	The choice of the terrains for settlement	36
1.4.7.2.	Distribution patterns	37
1.4.7.3.	The character of the inhabitation	38
1.4.7.4.	The coastal barriers	38
1.5.	An Outline of the Inhabitation in the Iron Age and later	42
1.5.1.	The transition Bronze Age/Iron Age	42
1.5.2.	The Iron Age	43
1.5.3.	The Roman Period	45
1.5.4.	The Merovingian Period	45
1.5.5.	The Carolingian Period	46
1.5.6.	From the later Middle Ages until recent times	46
1.6.	Inhabitation and the Transgression Phases	46
1.7.	Sea-level Changes	50
1.7.1.	Earlier investigations	50
1.7.2.	The time-depth graph of the archaeological sites	51
1.7.2.1.	The depositional level in relation to sea-level	51
1.7.2.2.	Compaction	53
1.7.2.3.	The graph	55
1.7.3.	The curve for the relative rise of the coastal mean high water level	57
1.7.3.1.	A first approximation	57
1.7.3.2.	The fluctuations of local mean high water level at the archaeological sites	57
1.7.3.3.	The construction of the curve	61
1.7.3.4.	The curves of Bennema (1954) and Jelgersma (1961, 1966)	63
1.7.3.5.	Eustatic, tectonic and isostatic components	64
1.7.3.6.	The curve after correction of ^{14}C years into solar years	67

1.8. Northern Germany and East England	69
1.8.1. Northern Germany	69
1.8.2. East England	72
1.8.3. Conclusion	76
2. GEOLOGY AND INHABITATION OF THE RIVER CLAY/WOOD PEAT AREA	
2.1. History of the Archaeological and Geological Investigations	79
2.2. The Geological Structure	83
2.3. The "Donken"	84
2.3.1. Earlier investigations	84
2.3.2. Origin and dating	85
2.3.3. Shape and distribution	86
2.3.4. Prehistoric occupation	87
2.3.4.1. The finds	87
2.3.4.2. The occupation of the <i>donken</i> in relation to that of the stream ridges	89
2.3.4.3. Conclusion	90
2.4. The Stream Ridges	90
2.4.1. General characteristics	90
2.4.2. Distribution and dating	91
2.4.3. The gradient lines	93
2.4.4. The oldest stream ridges: Calais II and III	95
2.4.4.1. Calais II	95
2.4.4.2. Calais III: the Asperen and Zijderveld ridges	96
2.4.4.3. The oldest prehistoric occupation of the Calais II and III deposits	96
2.4.5. The Schoonrewoerd and Schaik ridges: Calais IV	97
2.4.5.1. Description and dating	97
2.4.5.2. The "lung system" and the conditions that led to the formation of the Schoonrewoerd stream ridge	98
2.4.5.3. The break-through channels	100
2.5. Prehistoric Inhabitation in the Centuries after the Calais IV Transgression Phases .	103
2.5.1. Introduction	103
2.5.2. Explorations	104
2.5.3. The VBB/BWB inhabitation	105
2.5.4. Quantitative assessment of the sites on the Schoonrewoerd stream ridge. .	106
2.6. Later Landscape Development and Inhabitation	111
2.6.1. Dunkirk 0 and the Middle Bronze Age	111
2.6.2. The Late Bronze Age	114

2.6.3. The Iron Age and Dunkirk I	116
2.6.4. The Roman Period	118
2.6.5. The Early Middle Ages	120
2.6.6. The 11th century and later	120
2.6.6.1. Reclamation	120
2.6.6.2. Dike building and artificial drainage	121
2.6.6.3. Dike breaches	122
3. NEOLITHIC OCCUPATION ON THE HAZENDONK, MUNICIPALITY MOLENAARSGRAAF, 4000-1600 B. C.	
3.1. Introduction	127
3.2. The Geological Situation	129
3.2.1. Stratigraphy	129
3.2.2. Compaction	132
3.2.3. Sections of the excavation	135
3.3. Pollen Analysis, ¹⁴ C Dating	136
3.3.1. General remarks	136
3.3.2. The pollen diagram Hazendonk	138
3.3.3. The ¹⁴ C dates	139
3.3.4. Archaeological commentary	140
3.3.5. Summary	143
3.4. Soil Traces	143
3.5. The Finds.	144
3.5.1. Pottery	144
3.5.1.1. General remarks	144
3.5.1.2. Beaker pottery	146
3.5.1.3. Vlaardingen pottery	147
3.5.1.4. "Hazendonk pottery"	150
3.5.1.5. Other pottery	155
3.5.2. Flint	157
3.5.3. Worked stone	159
3.6. The "Hazendonk Pottery"; Dating and Cultural Relations	160
3.6.1. Dating.	160

3.6.2. Cultural relations	161
3.6.2.1. Introduction	161
3.6.2.2. Relation to the Vlaardingen Culture	161
3.6.2.3. Relation to "Swifterbant"	162
3.6.2.4. Relation to other Neolithic groups	165
3.6.2.5. Conclusion	167
3.6.3. The impossibility of a dating to the (Late) Bronze Age	167
4. A LATE BELL BEAKER/BARBED WIRE BEAKER SETTLEMENT AND CEMETERY ON THE SCHOONREWOERD STREAM RIDGE AT MOLENAARSGRAAF, CIRCA 1700 B.C.	
4.1. Introduction	171
4.1.1. Discovery and excavation	171
4.1.2. The geological and archaeological situation	172
4.2. Geological Conditions	175
4.2.1. Mapping	175
4.2.2. The geological structure of the site	176
4.2.3. Compaction	182
4.2.4. The "occupation layer"	183
4.3. The Position of the Finds in the Break-Through Channel	184
4.3.1. Vertical distribution	184
4.3.2. Horizontal distribution patterns	185
4.4. Palynological Investigation of the Gully Filling	187
4.4.1. The pollen diagrams	187
4.4.2. Archaeological commentary	189
4.4.3. Summary	190
4.5. Soil Traces	191
4.5.1. Short survey	191
4.5.2. Test pits	191
4.5.3. 16th century sand pits	191
4.5.4. Middle Bronze Age remains	193
4.5.5. Small discolourations and post holes	194
4.5.6. House plans	196
4.5.6.1. Construction of the plans	196
4.5.6.2. House I.	197

4.5.6.3. House II	198
4.5.6.4. Comparison, construction and sequence of both houses	201
4.5.6.5. Other post holes	202
4.5.7. Pits	203
4.5.8. Trenches	204
4.6. The Finds	205
4.6.1. General Remarks	205
4.6.2. Distribution of the finds over the settlement terrain	206
4.6.3. Pottery	209
4.6.3.1. General remarks	209
4.6.3.2. Pottery from the settlement terrain	210
4.6.3.3. Decorated pottery; decoration types	210
4.6.3.4. Pottery from the pit fillings	218
4.6.3.5. Pottery from the filling of the break-through gully	220
4.6.3.6. Distribution patterns of the decorated pottery	223
4.6.3.7. Conclusions: the occupation phases	226
4.6.4. Loam	228
4.6.5. Flint	229
4.6.6. Worked stone	234
4.6.7. Worked wood	236
4.6.8. The faunal remains	239
4.7. The Graves	242
4.7.1. Introduction; the cemetery	242
4.7.2. Grave I	243
4.7.3. Grave II	250
4.7.4. Grave III	260
4.7.5. Grave IV	263
4.7.6. Ox Grave	264
4.7.7. Comparison of the graves	267
4.7.8. The cemetery: dating and relation to the settlement	270
4.8. Summary and Conclusions	274
4.8.1. Environment	274
4.8.2. The site "Molenaarsgraaf"	275
4.8.3. Subsistence economy	277
4.8.4. Later features	278
4.9. Cultural Prehistoric Context	279

4.9.1. Introduction	279
4.9.2. Soil traces.	280
4.9.2.1. Post holes	280
4.9.2.2. House plans	280
4.9.2.3. The pits	286
4.9.3. The settlement finds.	286
4.9.3.1. The Bell Beaker pottery	286
4.9.3.2. The Barbed Wire Beaker pottery	288
4.9.3.3. Pot Beakers	290
4.9.3.4. Domestic pottery	292
4.9.3.5. Some final remarks on the pottery	295
4.9.3.6. The flint	297
4.9.3.7. The worked stone	298
4.9.3.8. The worked wood	300
4.9.4. The grave goods	301
4.9.4.1. The Veluwe Bell Beaker from grave I	301
4.9.4.2. The domestic beaker from grave II	302
4.9.4.3. The large beaker with reed impressions	303
4.9.4.4. The fish-hooks	304
4.9.4.5. The antler hook	304
4.9.5. The graves	305
4.9.5.1. General remarks	305
4.9.5.2. Veluwe Bell Beaker graves	306
4.9.5.3. Barbed Wire Beaker graves	308
4.9.5.4. The chronological-cultural position of the Molenaarsgraaf cemetery	309
4.9.5.5. Beaker skeletons in the Netherlands	310
4.9.6. The burial customs of the Netherlands Beaker Cultures in a wider context	312
4.9.6.1. The Bell Beaker Culture	312
4.9.6.2. The Battle Axe Culture	314
4.9.6.3. The transition of the Battle Axe to the Bell Beaker Culture	315
4.9.6.4. The transition of the Bell Beaker to the Early Bronze Age Cultures	318
4.9.6.5. The archaeological consequences of the anthropological data	319
4.9.7. The ox burial	321
4.9.7.1. Neolithic animal burials in the Netherlands	321
4.9.7.2. Neolithic animal burials in a wider context	323
4.9.8. Situation and subsistence economy	325
4.9.8.1. The site.	325
4.9.8.2. Reclamation	326
4.9.8.3. The fields and their working	327
4.9.8.4. The cultivated crops	328
4.9.8.5. The domestic animals.	329
4.9.8.6. The hunt	332

4.9.8.7. Fishing	333
4.9.8.8. Conclusions	334
4.9. 9. The ¹⁴ C dates	335
4.9.10. Review.	337
Appendix I Prehistoric sites and finds, mapped in the figures 2, 5, 7 and 8 . . .	341
Appendix II Data used in the construction of the graph in figure 11.	356
Appendix III List of Prehistoric and Roman sites and finds in the river clay/wood peat area, mapped in fig. 18.	361
Appendix IV Radiocarbon dates, established on behalf of this publication . . .	378
Appendix V Agatha S. Knip: Late Neolithic Skeleton Finds from Molenaarsgraaf (Z.H.)	379
Samenvatting (Dutch Summary)	396
Bibliography	398
Index of Find-spots	416

FOREWORD

Before 1950 the western river area, the region between Tiel and Alblasserdam, was, from an archaeological point of view, *terra incognita*—a blank space on the distribution maps. In subsequent years a few discoveries were made, particularly during the soil surveys, but it was the foundation in 1962 of the AWN work-group, “Lek en Merwestreek”, that marked the moment when systematic exploration began. Under the inspiring leadership of Mr H. A. de Kok scores of archaeological terrains, dating from the Vlaardingen Culture to the Middle Ages, were discovered. They lie on the deposits of former river courses and creek systems and on the tops of Early Holocene dunes. An intensive correspondence on the subject of these finds took place with Professor Modderman.

There are several reasons why the present writer was almost inevitably confronted with this material in 1965 and began to examine it in detail: the necessity for an inventory and evaluation of these finds, which were of such importance to our knowledge of early inhabitation of the Western Netherlands; the execution of a land re-allotment, which is meanwhile being finished; the need to accompany the work-group, and, last but not least, the author's interest in the inter-relationship of geology and archaeology, and the possibility of using the study of the region as the subject for a university thesis.

In the course of time the subject of the thesis has been extended and its accent has shifted. We soon came to the conclusion that a number of excavations would be necessary if we were to achieve the proposed results. In the Molenaarsgraaf district a preliminary investigation started on the “Hazendonk” in 1967. The “Molenaarsgraaf” terrain was almost completely excavated in 1966 and 1967. Three other excavations were carried out because of the threat of road construction works: in 1966 an Iron Age settlement near Culemborg, and in 1969 two terrains in Ottoland: the Oosteind terrain (VBB-LBA) and Kromme Elleboog (VBB/BWB). Both excavations in Molenaarsgraaf yielded so much information that its elaboration would demand a considerable amount of time. A report on the other three investigations will be given later.

At the same time it appeared to be desirable to locate the assembled information against a wider background, that of the whole of the Western Netherlands. Part I of this volume originated in this way and gives a survey of the history of inhabitation in the Western Netherlands, in particular of the period before 700 B. C. Its relationship to the geological development of the region, dominated by transgression/regression cycles, is of paramount importance here. The archaeological data contribute at the same time to the construction of a curve showing the relative rise in sea-level, in particular because the Alblasserwaard appeared to be an unusually favourable area for observations on former mean water-levels.

The original subject is discussed in Part II, in which we deal with the history of the inhabitation and the geological development of the western river area. It is not possible to comprehend the archaeology without the study of the landscape. On the other hand archaeology provides

the datings for various deposits, and especially for the stream ridges. Part II forms the first attempt for an archaeological diagram of the district.

The two last parts are reports on the two excavations at Molenaarsgraaf.

On the Hazendonk (Part III), the top of an Early Holocene dune, it has been proved that inhabitation took place there about 4100 (?), 3400, 3000, 2400 and 1700 B. C. A new group of pottery, provisionally named "Hazendonk pottery", was found and dated about 3000 B. C. The other occupation phases may be associated with "Swifterbant", the Vlaardingen Culture and the Veluwe Bell Beaker and Barbed Wire Beaker Cultures. The occupation phases coincide with the geological regression phases, and are separated by periods when there was no inhabitation.

At Molenaarsgraaf (Part IV) a small settlement from the transition period Neolithic-Bronze Age (VBB-BWB, 1800-1500 B. C.) was situated on the Schoonrewoerd stream ridge and at a break-through gully. It is one of a number of comparable occupation units on this stream ridge, which together formed a small elongated hamlet. In the settlement two subsequent house plans were documented. The infilling of the gully yielded information about the subsistence economy and the milieu (remains of slaughtered animals, pollen diagrams, wooden posts). Arable farming (grain) and cattle raising (primarily cows) were both practised. Hunting was of minor importance, in contrast to fishing. Three or four human graves and one ox grave contained well-preserved skeletons—a very unusual situation in the Netherlands. It was possible to construct a detailed chronological diagram of the settlement. The transition from Neolithic to Bronze Age seems to be marked by a great rate of cultural continuity. The cultural background of the house-plans, finds and graves are discussed in a separate paragraph.

The four parts are written in such a way that each part can be read independently. The particulars of both excavations (parts III and IV) are incorporated in the surveys (parts I and II). At the same time the conclusions in part II are used in the writing of part I. In the sequence presented here, from the general to the more specific, part II may be read as an introduction to the two excavation reports, and part I has more or less the same function for part II.

ACKNOWLEDGEMENTS

That the account of my investigations has got its present form is in large measure owing to the co-operation, interest, advice and practical help of a number of persons and institutions. I should like to express here my deep-felt gratitude to all those who have helped me.

Professor Dr P. J. R. Modderman generously made available all the data, assembled by him from the studied area, and gave moral and practical aid where necessary. Some long and intensive discussions with Professor Dr L. J. Pons led to a considerable improvement and modification of the text. Professor Dr A. Klasens gave me full liberty, within the requirements of my work, to pursue my studies.

Various experts reported on some categories of the excavated material. Miss Dr A. T. Clason (BAI) analysed the faunal remains, Miss A. S. Knip (Utrecht) described the human skeletons, Dr G. A. Mook and Professor Dr J. C. Vogel (Groningen) carried out the ^{14}C determinations, and Mr A. Voorrips (IPP) identified the wooden objects and conducted the palynological enquiry. All made available to me the essential information required. The detailed report of Miss Knip has been given as an Appendix. The expert reports on the faunal remains and the palynological enquiry will be published in specialist journals in due course.

Particular mention must be made of Mr H. A. de Kok (Hardinxveld) for the energy and enthusiasm with which he has for years carried out explorations with his work-group and for the generous way in which he made his records and material available to me. From our co-operation has grown a friendship which I value highly. I thank Mrs de Kok for the great hospitality she has always offered me.

Dr M. Geijh (Hannover), Miss Dr S. Jelgersma (Geological Survey), Mr J. N. Lanting (BAI) and Mr J. F. van Regteren Altena (ROB) read parts of the manuscript and discussed them with me. In addition they supplied me with a great deal of useful information.

Exchanges of views with my close colleagues, Mr A. Peddemors, Mr H. D. Schneider, Dr P. Stuart and Dr G. J. Verwers were a source of constant and much appreciated inspiration to me.

I received help or information from the following persons: Mr G. J. van den Beemt (ROB), Mr A. Bergkotte (Schiedam), Mr H. den Besten (Hei- en Boeicop), Dr W. H. Bierhenke (Hamburg), Mr Blikendaal (Molenaarsgraaf), Mr J. H. F. Bloemers (ROB), Dr R. Boddeke (IJmuiden), Mr J. A. Brongers (ROB), Prof Dr A. Brouwer (Leiden), Dr J. J. Butler (BAI), Mr C. van der Esch (Papendrecht), Dr H. H. Frese (Rockanje), the late Prof Dr A. E. van Giffen (Zwolle), Mrs Dr W. Groenman - van Waateringe (IPP), Mr H. M. E. van Haaren (Esch), Mr. O. H. Harsema (BAI), Mr G. D. van der Heide (Schokland), Mr C. Hoek (Rotterdam), Mr A. T. M. Hoogeboom (Noordeloos), Prof Dr J. Huizinga (Utrecht), Mr R. S. Hulst (ROB), Mr G. Kortebout van der Sluijs (Leiden), the late Dr R. S. Levison (Arnhem), Mr H. van der Lugt (Utrecht), Miss W. H. Metz (IPP), Mr C. J. Overweel (Leiden), Ir J. N. B. Poelman (Stiboka),

Ir J. A. C. E. van Roermund (Delft), Mr H. Sarfatij (ROB), Mrs E. J. Schreve-Brinkman (Naarden), Dr R. P.H. P. van der Schans (Stiboka), Dr D. D. A. Simpson (Leicester), Prof Dr Ch. Thomas (Leicester), Mr A. Verbraeck (Geological Survey), Mr P. Verhagen (Gorinchem), Mr A. D. Verlinde (ROB), Prof Dr J. D. van der Waals (BAI), Prof Dr H. T. Waterbolk (BAI), Mrs L. H. van Wijngaarden-Bakker (IPP).

The good co-operation with the Reallottment Committee and the *Cultuurtechnische Dienst* (Governments Service for Land and Water Use) in the Alblasserwaard was much appreciated. The Soil Survey Institute (Stiboka) placed unpublished maps at our disposal and gave the permission to print the map, that we compiled from them. The *Nederlands Genootschap voor Anthropologie* supported this publication by paying the cost of the making of the blocks.

John Caspers made all the drawings in this book. His devotion and patience, together with his technical and artistic capacities, formed the basis of the success of our co-operation.

Mr E. T. Davies (Bunnik) translated the Dutch text into English. I recall with much pleasure his scrupulous care and our efficient co-operation.

But the author considers himself responsible for any possible inaccuracies and obscurities that may occur in the text, especially in those passages which were later inserted.

In the field, in the development of data and in preparing the manuscript for the press I have received help from Mr J. P. Boogerd and Mr W. Meuzelaar (both IPL), Mr H. Kok and Mr M. van Meerkerk (both Geological Survey), Miss I. M. Ebbinge, Miss H. A. Hasselbach, Miss C. M. M. Pieterse, Mrs S. D. R. Versteeg-Middendorp, Mr F. G. van Veen, Mr M. T. Vinkesteyn and Mr B. H. van Winkel (all RMO).

During my research I was frequently conscious of the value of the education as a physical geographer and prehistorian I received from the late Professor Dr H. P. Berlage, the late Professor Dr W. Bleeker, Professor Dr P. Buringh, Professor Dr Ir C. Koeman, Professor Dr G. H. R. van Koenigswald, the late Professor Dr M. Minnaert, Professor Dr P. J. R. Modderman, the late Professor Dr M. G. Rutten, and Professor Dr J. I. S. Zonneveld. Further, the instruction I received in the field, especially from the late Mr M. W. Beyerinck, Mr K. H. Hoeksema and the late Mr C. H. J. van Rossum, who led my first visits to the peat region, was of great value to me.

I can imagine that the writing of this book was not always enjoyed by my wife and children, since I had to withdraw from my obligations as a father too often. Nevertheless Anneke showed the interest and patience, which were essential for me to accomplish the work. I owe my parents a great debt of gratitude for all stimuli and opportunities they offered to me during my education and study. I tried to express my feelings in dedicating this book to them.

ABBREVIATIONS

(those in brackets are only used in Appendix I)

Aarbøger	Aarbøger for Nordisk Oldkyndighed og Historie
A.D.	Anno Domini
AN	Archeologisch Nieuws: Nieuwsbulletin, maandelijks bijlage van het Bulletin van de Koninklijke Nederlandse Oudheidkundige Bond
AOC	All Over Cord
APL	Analecta Praehistorica Leidensia
AWN	Archeologische Werkgemeenschap voor Nederland
BAI	Biologisch-Archeologisch Instituut, Groningen
B.C.	Before Christ
Ber. RGK	Bericht der Römisch-Germanischen Kommission
Ber. ROB (BROB)	Berichten van de Rijksdienst voor het Oudheidkundig Bodemonderzoek
BJ	Bonner Jahrbücher
BSPF	Bulletin de la Société Préhistorique Française
Bull. KNOB	Bulletin van de Koninklijke Nederlandse Oudheidkundige Bond
BW	Barbed Wire
BWB	Barbed Wire Beaker
C I-IV ^b	Calais I-IV ^b
D 0-III	Dunkirk 0-III
DKS	Drakenstein
EBA	Early Bronze Age
<i>et al.</i>	<i>et alii</i> (and others)
HaB	Hallstatt B
(Hel)	Helinium
HVS	Hilversum
IPL	Instituut voor Prehistorie, Leiden
IPP	Instituut voor Prae- en Protohistorie, Amsterdam
Jahrbuch RGZM	Jahrbuch des Römisch-Germanischen Zentralmuseums Mainz
Jshr. mitteldt. Vorgesch.	Jahresschrift für Mitteldeutsche Vorgeschichte
LBA	Late Bronze Age
MBA	Middle Bronze Age
MBB	Maritime Bell Beaker
Med. Geol. Sticht.	Mededelingen van de Geologische Stichting
Med. Rijks Geol. Dienst	Mededelingen van de Rijks Geologische Dienst
MHW	Mean High Water
MSL	Mean Sea-Level
mun.	Municipality
NAP	Normaal Amsterdams Peil (Dutch Datum Level)
NN	Normal Nul (German Datum Level)
NNU	Nachrichten aus Niedersachsens Urgeschichte
OD	Ordnance Datum
Oudh. Med. (OML)	Oudheidkundige Mededelingen uit het Rijksmuseum van Oudheden te Leiden

PCAS	Proceedings of the Cambridge Antiquarian Society
PFB	Protruding Foot Beaker
PPS	Proceedings of the Prehistoric Society
PZ	Prähistorische Zeitschrift
RMO	Rijksmuseum van Oudheden, Leiden
ROB	Rijksdienst voor het Oudheidkundig Bodemonderzoek, Amersfoort
R-W	Ruinen-Wommels
Stiboka	Stichting voor Bodemkartering, (Soil Survey Institute), Wageningen
TAG	Tijdschrift van het Koninklijk Nederlands Aardrijkskundig Genootschap
<i>t.a.q.</i>	<i>terminus ante quem</i>
<i>t.p.q.</i>	<i>terminus post quem</i>
TRB	Trechterbeker (= Funnel Beaker)
VBB	Veluwe Bell Beaker
Versl. Landb. Ond.	Verslagen van Landbouwkundige Onderzoekingen
VL	Vlaardingen
Voetspoor	In het voetspoor van A.E. van Giffen, 10 jaar I.P.P., Groningen, 1966 (2nd impression).
WF Oudh. (WFO)	Westfriese Oudheden
(Wh)	Westerheem

POSTSCRIPT

It is one of the disadvantages of a publication of this plan and diversity that it cannot be fully up-to-date in most respects. After the enquiries were ended and the manuscript was closed (in the beginning of 1973) new finds have been made, new data have come available and a number of papers have appeared, that have reference to various aspects of this work.

The following applies to Part I. The continued investigations at Swifterbant, especially the undertaken full excavation of a third site, provide more detailed data on the living situation of the Early Neolithic communities, than used in this paper. The occupation on the dunes appeared to be partly of Mesolithic age (^{14}C dates). New VL Culture sites have been discovered at Loosduinen (near The Hague), Ewijk (Betuwe) and Kootwijk (Veluwe) which means a further extension eastward and a firmer link to the sand regions. The study of the distribution and sequence of the occupation around the Meuse estuary, undertaken by Mr J. F. van Regteren Altena and Mr D. P. Hallewas on behalf of sheet 37 of the new geological map, will provide a more detailed picture than used by us. Of special importance is the Middle Bronze Age date of human influences on the vegetation, established by Mr J. de Jong (Geological Survey), in a pollen diagram near Vlaardinggen. It helps to bridge the gap in the MBA occupation pattern between Molenaarsgraaf and the coastal barriers.

Anne V. Akeroyd recently published a very critical and well-documented review of all observations that are of relevance to the establishment of former water levels along the British coast between Wight and the Humber. (Philos. Transact. Royal Soc. London, Series A, Vol. 272, 151-169). Although the "translation" of the field observations into former sea-level heights might sometimes be open to some criticism, while compaction could not be taken into account, it appears that the general tendency of the rise in sea-level in East England agrees very well with that in the Netherlands. The transgression-regression cycles are, however, still rather obscure.

In *Quaternaria XIV* (1971) we find the contributions to the 8th INQUA congress in Paris. The papers provide information on the Holocene sea-level changes all over the world. We mention here only the curve of Hawkins for S.W.-Britain, which is very similar to that of Akeroyd and to our curve for the North Sea (Louwe Kooijmans 1970/71, fig. 3).

New evidence for Part II is provided by the excavation led by Mr Sarfatij and the borings of the Geological Survey at the site Alblasserdam 3^a (App. III, no. 7). A small residual channel of the creek followed there the extreme southern side of the ridge and was contemporaneous with the Roman occupation, the level of which had later undergone considerable compaction where it was situated on the soft high water deposits of the creek.

With respect to Part III the discovery of a second site with Hazendonk pottery at Het Vormer near Wijchen is very important, the more since it occurs there together with sherds of

bowls with round bottoms of Belgian Michelsberg and perhaps Windmill Hill affinities. Only a short reference (p. 166 note 77) could be made to this material. In *Analecta Praehistorica Leidensia* VI the report on Koningsbosch (*cf.* p. 159, 165) appeared. It seems that the relationships to the Hazendonk pottery are small and that this group is probably a few centuries later, dating from the same phase as Stein.

Three publications have appeared in the end of 1973 which are of great importance for the matters dealt with in Part IV, especially section 4.9. First, J.N. Lanting gave a full discussion of the typology and dating of the BWB pottery and the burial ritual of this phase in *Palaeohistoria* XV. With regard to our more sketchy review this article contains much detailed background material together with unpublished or re-interpreted data of old BAI excavations and information on recent work, among other things additional ^{14}C dates. It appears that the phase before the BW Beakers in the Northern Netherlands is characterized by E-W graves with battle axes of the newly defined Zuidvelde and Emmen types and flint knives of the type as our fig. 97^e. Lanting stresses the continuity of the pottery traditions (workmanship, forms, decoration) and grave ritual, while we stressed (p. 339) the more or less contemporaneous and sudden changes in these culture-elements. The frequent references to the data of Molenaarsgraaf in Lanting's paper underline the contribution given by this site to our knowledge of this period.

In *Helinium* XII, 3 (1972) the report of the excavation of barrow III at Anner Tol adds a new well-dated (relatively late) BWB grave to the list. The next number of *Helinium* (XIII, 1) contains a publication by Lanting, Mook and Van der Waals on the ^{14}C chronology of the various beaker groups. The survey of the impressive number of ^{14}C dates for Dutch (and a few German) Beakers is the basis for a discussion about the possible local origin of the Bell Beaker and the Bell Beaker find-association (BB Culture). But many questions appear still to remain unanswered.

1. PREHISTORIC INHABITATION AND SEA-LEVEL CHANGES IN THE WESTERN NETHERLANDS ¹

Seldom do natural circumstances influence the settlement patterns and inhabitation sequence so thoroughly as in the sea-level-governed Holocene sedimentation area at the Rhine/Meuse estuary. In a general survey of the archaeological remains and data the influence of the transgression-regression cyclicality on the occupation history is worked out. Finally the archaeological data are used to construct a new, detailed curve for the relative rise of the Mean High Water level in the Rhine mouth district.

¹ By "Western Netherlands" in this paper is meant the Holocene sedimentation area at the lower courses of the rivers Rhine, Meuse and Scheldt, as indicated in fig. 1. So the IJsselmeer district and the river clay area (Betuwe) are included too.

