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

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

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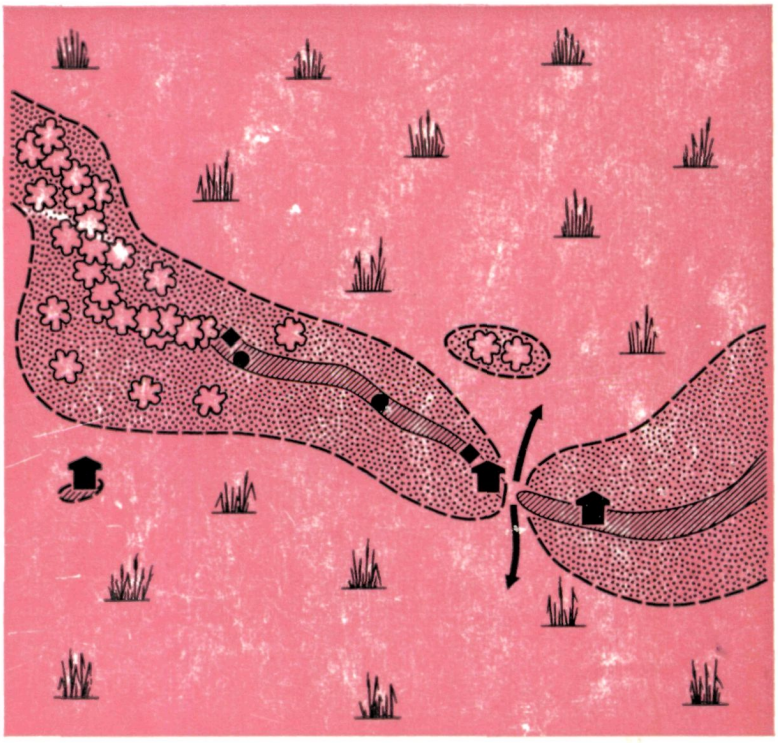

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L. P. LOUWE KOOIJMANS

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.)

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TO MY PARENTS

TO HUIB DE KOK

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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 Bliekendaal (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. Kortenbout 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),

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The good co-operation with the Reallottment Comittee 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, maandelijkse 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-Archaeologisch 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
et al.	*et alii* (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
Jschr. 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
t.a.q.	*terminus ante quem*
t.p.q.	*terminus post quem*
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 Vlaardingen. 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 Quarternaria 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 knifes 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 thouroughly 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 cyclicity 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.

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[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.