

LATE VISTULIAN AND HOLOCENE INLAND DUNES IN THE CENTRAL PART OF THE FORMER GDR — AN OVERVIEW OF POST-WAR RESEARCH

WIERD MATHIJS DE BOER

Humboldt University, Section of Geography, Berlin, Germany

Manuscript received 8th February 1991

Revised version 20th May 1993

Boer W.M. de, 1993. Late Vistulian and Holocene inland dunes in the central part of the former GDR - an overview of post-war research. *Quaestiones Geographicae* 15/16, Adam Mickiewicz University Press, Poznań 1993, pp. 23-25. ISBN 83-232-0454-3. ISSN 0137-477X.

ABSTRACT. The inland dunes of the young moraine area (=area formerly covered by the Weichselian ice cap) of the former GDR, south of the Pomeranian terminal moraine, have never been the subject of an overall treatment, that means, a review of existing publications is missing. In this article a review of literature from 1945 onwards is presented, with emphasis on the dating of the inland dunes due to a lack of knowledge on this subject. Most authors accept a periglacial genesis of the majority of the inland dunes ("Altdünen"). During the Holocene a transformation of a part of those Late Glacial continental dunes took place ("Jungdünen mit Altdünenkern"), and also new forms developed ("Jungdünen"). The grain-size distribution, forms and geographical distribution of the inland dunes in the study area are relatively well described by Seeler (1962), Noack (1965) and others. The inland dunes were mainly formed by westerly winds. They can reach heights from 15 up to 25 m.

Wierd Mathijs de Boer, Sektion Geographie, Humboldt-Universität zu Berlin, Universitätsstrasse 3b, Berlin 1080, Germany.

1. Introduction

The study area is situated between the southern and western border of the Baruth ice-marginal valley, the southern border of the Pomeranian terminal moraine and the rivers Oder and Neisse in the Central part of former GDR.

The forms and the geographical distribution of the inland dunes in the study area are relatively well known through publications by Seeler (1962), Noack (1965) and others. The most common inland dunes in the study area are longitudinal, transverse, parabolic and hummocky dunes (as defined by Kaiser et al., 1989, 110). The dunes reach heights from 15 up to 25 m. A great part of the dunes are to be found on the (north-)east sides of the ice-marginal valleys and on big outwash plains. This is one of many proofs of a west wind (trans-)formation of the dunes in the study area (Noack, 1965).

The main grain-size distribution, expressed as a D50-value, varies between 0.15-0.30 mm after various authors.

The dating of the continental dunes in the study area is still a problem. Most authors accept a periglacial genesis of the majority of the inland dunes (the so-called "Altdünen").

A differentiation of the Late Glacial dune formation in separate phases and / or areas doesn't exist for the study area. In the Holocene a transformation of a part of the Late Glacial inland dunes has taken place ("Jungdünen mit Altdünenkern") and also new forms developed ("Jungdünen"). A differentiation of Holocene dune formation in separate phases and / or areas doesn't exist either.

2. The Baruth ice-marginal valley between Havel mouth and Neisse

2.1. The Baruth ice-marginal valley

On the reworked, sand covered mound of the river Spree inland dunes of major extent and up to 15 m in height are found which consist of sands with a D50 between 0.20-0.30 mm and which were formed by W-SW-winds. They were primarily formed during the Atlantic and afterwards. They were set in motion again at the beginning of the 6th century, and were still in motion during the 12th century (Magalowski & Nowel, 1982).

The inland dunes in the Baruth ice-marginal valley between Luckenwalde and Lübben are 5-15 m high and were formed by WSW-WNW-winds (de Boer, in press). The dune sands near Baruth have predominantly a D50-value between 0.20-0.30 mm (Stöpel, 1969). Gramsch (1969) described an archaeological site of the Federmessergroup north of Golssen. The artefacts, found in a palaeosol between two aeolian layers, are dated to the Alleröd-Interstadial. It indicates a Late Glacial genesis of the oldest layer. The uppermost layer was formed after the Young Bronze Age / Early Iron Time.

2.2. The Baruth ice-marginal valley and the Elbe valley

Dunes in this area were formed by WSW-winds (Richter, 1961). Richter (1961) discovered four archaeologically important palaeosols (Ranker) in a dune near Fischbeck. They come successively from the Late Neolithic (ca. 2800-2200 BC), the Late Bronze-Age (ca. 1300-800 BC), the Early Iron Age (ca. 600-100 BC) and the Slavonic Time (ca. 550-1200 / 1400 AD). The first mentioned aeolian cover was only 30-50 cm thick.

Linke (1968) studied some dunes in an area 15 km east of the river Elbe, which were formed between the 12th century and the second half of the 19th century. These agricultural, man induced dunes ("Ackerdünen") are up to 0.90-2.50 m high.

3. Between the Baruth ice-marginal valley and the Berlin ice-marginal valley

Müller et al. (1971) proved that a dune near Schwenow was initially formed between 7000-11000 BP. The datings are obtained by means of pollen analysis and seven ¹⁴C samples. Furthermore they proved that a dune near Hermsdorf was formed between 5000-6000 BP. The dating is obtained by means of pollen analysis. Solger (1960) pointed to aeolian redeposition in the Holocene which he believes to be a Late glacial dune in Dabendorf by mentioning an overblown peat layer.

4. The Berlin ice-marginal valley and surroundings, between Havel mouth and Oder

Reinbacher (1957) discovered two arrowheads from the Alleröd-Interstadial in a palaeosol near Berlin-Biesdorf. A second palaeosol overlying the first was dated to Roman Time. Gramsch (1959) and

Feustel (in Herrmann et al., 1989, 44 / 45) described some artefacts from the Swidérien-Group (Alleröd) under an aeolian sand cover of 20-45 cm thickness, deposited by W-NW-winds near Münchehofe, east of Berlin. Two other palaeosols (Ranker) covering the first mentioned were observed, the middle of these three dated to the Atlantic.

5. Between the Berlin ice-marginal valley and the Frankfurt intermediate Stadium, not including the Eberswalde ice-marginal valley

Reinbacher (1963) studied a graveyard of the Iron Time about 600-100 BC in a dune near Börnicke. Three main phases of usage of this 3.5 metres high dune were distinguished (Gustavs in Herrmann et al., 1989, 498/99).

6. The Eberswalde ice-marginal valley and surroundings between Oderbruch and Havel mouth

Liedtke (1957) dated dunes from the Older or Younger Tundra-Age some up to 6 metres high and formed by west winds, in the Eberswalde ice marginal-valley, by means of geomorphological observations. Chrobok and Nitz (1987) showed that some dunes near Biesenthal must have been formed during the Bölling-Period and later as they are covering ¹⁴C-dated Lime layers from the Bölling-Period.

7. Several other areas between the Frankfurt intermediate moraine and the Pomeranian terminal moraine, except of the Eberswalde ice-marginal valley

Normann and Quicker (1988) have carried out some research on a dune situated on the east bank of Lake Müritz. The analysed samples of sands have a mean D50 of 0.15 mm. They suggest that some dune forming phases took place in historical times, but do not present datings.

8. Discussion

In two publications only, radio carbon datings of palaeosols were used (in connection with pollen analysis): Müller et al. (1971) and Nowel et al. (1972). Otherwise, datings were done with the help of pollen analysis and / or archaeology (Reinbacher,

1957; Gramsch, 1959; Richter, 1961; Keiling, 1961; Reinbacher, 1963; Magalowski and Nowel, 1982). Sometimes also soil analysis was used as a dating tool (i.e. Linke, 1968; Kopp, 1969; Wetzel, 1969; Müller et al., 1971; Nowel et al., 1972). Thermoluminescence (TL) has never been used for dating inland dunes in the former GDR.

All of the Late Glacial and Holocene archaeologically distinguished cultures are to be found in palaeosols in inland dunes. Dune formation therefore, took place between those phases. But it is not known how far man was responsible for the dune forming in the specific phases. This aspect should also be an aim of further research. Palaeosols are not studied intensively in most of the cited works on the study area. It should be integrated in future dune studies because many problems in respect of this are still unsolved.

A few authors described one or more dunes with the help of several methods (i.e. Linke, 1968; Müller et al., 1971; Nowel et al., 1972), but most authors used mainly one method of investigation. One of the causes is that much knowledge is gathered as a kind of by-product of other sciences as there are archaeology, biology, soil science and cartography. Besides, only separate dunes or small areas are described: only Seeler (1962) and Noack (1965) wrote about larger areas. A problem with these publications is a too heavy stress on cartography and the lack of new datings. A research recommendation therefore is to date a series of dune areas in the central part of former GDR with the help of as many dating techniques as possible.

It appears that most of the dunes in the study area reach up to between 15 to 25 m. In some neighbouring areas the dunes are much lower, i.e. in the Altmark: 2-7 m and in the Ueckermünder Heide: 2-4 m. An explanation is possibly the lack of sufficient transportable sands in those areas. No general difference in height from west to east could be recognized.

9. Conclusion

Apart from Solger (1960) all authors who wrote about the research area after 1945, agree on a predominantly west wind formation. The dunes, which can be classified into longitudinal, transverse, parabolic and hummocky dunes, reach heights from 15 up to

25 m. A great part of the dunes are to be found on the (north-)east sides of the ice-marginal valleys and on big outwash plains. The main grain-size distribution, expressed as a D50-value, varies between 0.15-0.30 mm. The dunes were being formed in all Pollenzones (I to X) as defined by Firbas (1949). However, the phases of strongest dune formation were Pollenzones Ic (Earlier Dryas Stadial), III (Late Dryas Stadial), VIII (Subboreal), IX and X (Subatlantic). Mankind had an increasing influence in the course of those stages.

References

- Boer de, W.M. (in press): Dünen im Baruther Urstromtal (Raum Luckenwalde-Baruth-Lübben); Stand der Forschungsliteratur., *Biologische Studien* 19, Luckau
- Chrobok, M. and Nitz, B., 1987: Die Entwicklung des Gewässernetzes des Oberen Finow vom Blankenberg-Interstadial bis heute., *Wiss. Z. Univ. Greifswald* 36: 20-25
- Firbas, F., 1949: Spät- und nacheiszeitliche Waldgeschichte Mitteleuropas. Jena, 480 pp.
- Gramsch, B., 1959: Probegrabung auf dem spätpaläolithischen Rastplatz bei Münchehofe, Kr. Strausberg. *Ausgr. und Funde* 4: 67-70
- Gramsch, B., 1969: Ein Lagerplatz der Federmesser-Gruppe bei Golssen, Kr. Luckau. *Ausgr. und Funde* 14: 121-128
- Herrmann, J. et al., 1989: Archäologie in der DDR. Leipzig-Jena-Berlin, 1. Teil: 880 pp. 2. Teil: 343 pp.
- Kaiser, K., 1969: Spätglaziale und holozäne Dünen im Rendsburger Staatsforst beiderseits des mittleren Sorgetales zwischen Tetenhusen/ Föhrdern und Krummenort (Schleswig-Holstein). *Meyniana* 41: 97-152
- Kopp, D., 1967: Die Bodenformen in den Wäldern des nordostdeutschen Tieflandes. *Habil.-schr. T. U. Dresden*: 102-103
- Liedtke, H., 1957: Einige Beobachtungen an norddeutschen Dünen. *Wiss. Z. der Humboldt-Universität Berlin* 7: 445-448
- Linke, M., 1968: Ein weiterer Beitrag zur Frage der Altersstellung der Binnendünen. *Hercynia* 5: 420-436
- Magalowski, G. and Nowel, W., 1982: Untersuchungen an Binnendünen in der Umgebung von Cottbus und Beziehungen zur Besiedlungsgeschichte dieses Raumes. *Z. geol. Wiss.* 10: 829-843
- Müller, H. et al., 1971: Pollenanalytische Untersuchungen zur Altersbestimmung von Humusaufgaben einiger Bodenprofile im subkontinentalen Tieflandgebiet der DDR. *Petermanns Geogr. Mitt.* 115: 25-36
- Noack, S., 1965: Geomorphologische Kartierung der Binnendünen des Südostraumes der DDR. *Diss. A. Univ. Halle*: 103 pp.
- Normann, O. and Quicker, R., 1956: Äolische Akkumulationskörper im Bereich des NSG "Ostufer der Müritz". *Dipl.-Arb. Humboldt- Univ. Berlin*: 72
- Nowel, W. et al., 1972: Neue Ergebnisse zur Dünenbewegung im Baruther Urstromtal. *Z. ang. Geol.* 18: 410-418
- Reinbacher, E., 1957: Zwei Stielspitzen von Berlin-Biesdorf. *Ausgr. und Funde* 2: 163
- Reinbacher, E., 1963: Börnicke, ein ältereisenzeitlicher Urnenfriedhof im Havelland. *Deutsche Akad. der Wiss. zu Berlin. Schr. Sekt. Vor- und Frühgesch.* 14: 1-17
- Richter, G., 1961: Eine Dünengrabung in der Elbniederung bei Fischbeck, Kr. Havelberg. *Ausgr. und Funde* 6: 13-15
- Seeler, A., 1962: Beiträge zur Morphologie norddeutscher Dünengebiete und zur Darstellung des Dünenreliefs in topographischen Karten. *Diss. A. Univ. Greifswald*, 202 pp.
- Solger, F., 1960: Das Dünengelände von Dabendorf. *Heimatkalender für den Kreis Zossen* 3: 142-146.
- Stöpel, C., 1969: Periglaziale Anlage und anthropogene Formenveränderung von Dünen im Gebiet östlich von Baruth. *Staatsexamensarb. Humboldt- Univ. Berlin*: 1-20