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MEETINGS OF THE ROYAL BOTANICAL SOCIETY OF THE NETHERLANDS

MEETING OF THE SECTION FOR VEGETATION RESEARCH ON NOVEMBER 20, 1979

F. P. JONKER *(Brugstraat 2, 4147 AX Asperen)*

Introductory remarks

W. H. ZAGWIJN *(Rijks Geologische Dienst, Haarlem)*

Geology and paleogeography of the peat-moor area

W. A. CASPARIE[1] and B. VAN GEEL[2] *([1]Biologisch-Archaeologisch Instituut, Poststraat 6, 9712 ER Groningen; [2] Hugo de Vries Laboratorium, Afdeling Palynologie, Sarphatistraat 221, 1018 BX Amsterdam)*

Is there a climatically determined correlation between transgressions and regressions and ombrogenous peat growth?

According to some authors the sequence of transgressions and regressions in the Dutch coastal area (Calais and Dunkerque transgressions and Holland peat, respectively) and in South Sweden can be related to climatic oscillations. Fluctuations in the humidity of the ombrogenous peat-producing environment have generally been attributed to fluctuations in precipitation and/or temperature in Atlantic, Subboreal and Subatlantic periods. The question posed here is whether or not the climate is the direct determining agent in both the sedimentary rhythmics and the ombrogenous peat growth.

Peat studies by B. van Geel in the Wietmarscher Moor and the Engbertsdijksveen have resulted in a detailed picture of local peat successions. In the period between c. 1600 and 500 B.C. (Subboreal/Subatlantic transition) the climatic deterioration, recognized throughout NW Europe, does not appear to be a single transition. There is a series of cyclic fluctuations in the effective precipitation with a tendency towards a quantitative increase, eventually resulting in the growth of "Younger Sphagnum peat" in the raised bogs. In the period between 2000 and 1200 B.C., relatively dry phases of ombrogenous peat growth seem to be synchronous with regression phases distinguished in the coastal area. There are hardly any recognizable parallel developments in the ombrogenous peat growth and in the transgressions and regressions from 1200 to 500 B.C.

Stratigraphic peat research by W. A. Casparie in south-eastern Drenthe resulted in the recognition of about 10 wetter phases in ombrogenous peat growth since c. 4500 B.C., often alternating with peat layers formed under somewhat drier conditions. In most cases these variations in humidity are of a limited extent and changes in the local situation (hydrology, relief, erosion, etc.) are demonstrably the primary agent. It has also been established that change in the humidity and humification of the peat (e.g. a turn to "wet" fresh peat) can take place without changes in precipitation. As a consequence of the availability of a water surplus for ombrogenous peat growth, the water supply on the peat surface plays a very important role.

The general conclusion can be drawn that parallels in the sequence of transgression and regressions on the one hand and wet/dry fluctuations in ombrogenous peat growth on the other are apparent. Van Geel would not exclude a distinct climatical connection, but a causal relation is not demonstrable. Casparie is convinced that there is only an incidental coincidence of the phenomena; there is no question of a single, common climatic component on the basis of the evidence available.

J. F. VAN REGTEREN ALTENA *(Rijksdienst voor het Oudheidkundig Bodemonderzoek)*

The history of the occupation of the peat-moor area

M. BAKKER and D. G. VAN SMEERDIJK *(Hugo de Vries-Laboratorium, Afdeling Palynologie en Paleoecologie, Sarphatistraat 221, 1018 BX Amsterdam)*

Reconstruction of vegetational development in Het Ilperveld (N.H.) from 3000 BC to 1000 AD

A four metre section, containing marine clay and peat deposits taken at the nature conservancy "Het Ilperveld" in the western part of the Netherlands was palynologically examined at 1 to 2.5 cm intervals for pollen and microfossils and at 5 to 10 cm intervals for macrofossils.

The diagrams showed development starting from Subboreal tidal flat vegetation, via a eutrophic *Phragmites-Typha* marsh and an open parkland with birch to an oligotrophic moor. The latter was at first dominated by *Calluna vulgaris*, later to become accompanied by *Erica tetralix*, which dominated the local stand of vegetation in the following phase. This Ericaceae-rich moor existed from ± 2260 to ± 550 years B.P. The next phase in vegetational development was a *Sphagnum* bog with *Sphagnum imbricatum*, *Sphagnum papillosum*, *Sphagnum* section *Acutifolia* and *Sphagnum magellanicum* as the dominant species. In the ninth century AD the oligotrophic peat growth ceased and the site became covered by a eutrophic *Juncus* marsh.

Possibly the disappearance of the oligotrophic moor was the result of increasing human influence in the area.

The purpose of the present investigation was an extension of the studies of Dr. B. Polak in the same area in the early twenties. She already suggested development from eutrophic *Phragmites* marsh to an oligotrophic *Calluna* moor which started on the clay and not in open water.

A moisture condition curve, based on a number of microfossils, was compared to those of others sites in the Netherlands. An attempt was made to find a correlation between transgression phases in the western Netherlands and wet periods at the site studied.

J. WIEGERS *(Hugo de Vries Laboratorium, Sarphatistraat 221, 1018 BX Amsterdam)*

Some aspects of peat-forming vegetations in the Dutch Haf-district

Until the beginning of this century the ombrotrophic character of the peat deposits in the western part of the Netherlands was not recognized. Since then both palaeobotanists and vegetation ecologists have gained deeper insight in recent and fossil peat-forming vegetations in this area. The former influence of the sea is still visible in the species composition of the vegetation in different parts of Holland, caused mainly by a macro-gradient in salinity of the surface waters. A description of the succession stages recognized in the last 40 years with the aid of structural characteristics of the vegetation might be useful to compare the as yet mainly floristically based seres. The development of *Alnus*- and *Betula*-carr into ombrotrophic peat-bog has frequently been found in palynological research, but it must be questioned whether such a development could still take place in recent vegetations. As there is a considerable gap in time between the working areas of the palaeobotanist and the vegetation ecologist, it is doubtful to ascribe to aggregations of fossil plant remains names of syntaxonomic units at the association level. The species composition of some parts of the sediment, however, does in some cases strongly remind of recent vegetation types. Most peat-forming vegetations in this area nowadays consist of a flowing mat of plants. Peat-forming in the past took place under rather different ecological conditions. This introduces a second uncertainty in the comparison of recent events with those that took place in the past. Moreover, some species have already largely disappeared from western Europe (e.g. *Scheuchzeria palustris*, *Sphagnum imbricatum*), other species seem to be disappearing gradually (e.g. *Cladium mariscus*, *Stratiotes aloides*), and others have invaded this area in recent times (e.g. *Oxycoccus macrocarpos*, *Aronia* sp.). Recent research supports the views of POLAK (1929) considering the regeneration of the peat in Holland and adds more arguments to support them.

POLAK, B., 1929. *Een Onderzoek naar de botanische Samenstelling van het Hollandsche Veen.* Thesis, Amsterdam.

C. M. VAN DER STRAATEN *(Laboratorium voor Algemene Natuurkunde, afd. Isotopenfysica, Westersingel 34, 9718 CM Groningen)*

Deuterium as a palaeo-climatological indicator

In this study the possibility of using the deuterium content of peat as a palaeo-climatological indicator is investigated. The deuterium content is measured as the deviation from the isotopic ratio ([D] / [H]) of ocean water:

$$\delta D = \frac{[D]/[H] \text{ sample}}{[D]/[H] \text{ ocean water}} - 1,$$

expressed in $^0/_{00}$.

From monthly precipitation samples taken in many different locations all over the world, a linear relationship between the yearly average value of δD and the temperature can be derived for temperate climates, where $d\delta D/dT \approx 5^0/_{00}/°C$, a result which can be explained theoretically. If this relation is valid under all circumstances, the past growth temperature of the peat plants can be deduced from δD measurements on peat samples.

Due to the chemical and biological processes taking place during the transformation of plant material into peat and possibly changing the deuterium content, it is necessary to separate and analyze a stable hydrogen containing component. For this we have chosen the carbon-bound hydrogen of the cellulose in the peat. This hydrogen is converted to hydrogen gas, which is analyzed mass-spectrometrically. For one sample, about 5 g of dry peat is required. The overall measuring precision is about $2^0/_{00}$, which implies that the temperature during the growth of the plants can be determined with a precision of 0.4 °C.

In order to be able to use this isotopic "thermometer", it must be known how the deuterium content of plants depends on

1) the species of the plants
2) the circumstances under which the plants grow.

Neither question can be answered unambiguously at present, but the fact that a peat sample consists of the remains of many plants, grown over many years, suggests that within one peat profile these factors might not be relevant.

Two peat profiles have been measured (Nieuw Schonebeek and Meerstalblok), and both show a similar behaviour of δD vs. time. The most notable fact is a drop for δD of $\approx 20^0/_{00}$ at 800 BC, which suggests a temperature decrease of ≈ 4 °C for the transition from Subboreal to Subatlantic.

MEETING OF THE SECTION FOR VEGETATION RESEARCH ON DECEMBER 13, 1979

H. M. VAN DE STEEG *(Afdeling Geobotanie, Toernooiveld, 6525 ED Nijmegen)*

The "Leemputten" near Staverden as an example of habitat creation

H. KRONENBERG and G. L. VAN WINKEL *(Landbouwhogeschool, Wageningen)*

Landscape mapping for land management planning at Vals (GR), Switserland

The project "Vals" has been carried out by six students from the Agricultural University of Wageningen, summer 1978 at Vals (GR) in the Swiss Alps. Staff-attendants were: dr. L. v. d. Plas, Mrs. dr. C. Sloet van Oldruitenborgh, dr. ir. H. Doing, ir. H. Rogaar; Toon Abrahams, Wim Janssen, Leen Kuiper, Alfons de Kruif, Hanna Kronenberg and Gabriël van Winkel were the participating

students. Since the objective was to work towards a land management plan, a 1 : 10,000 landscape map had to be made, based on integrated field surveys (geomorphology, soils, vegetation, nature management).

The theme of the study was the extensifying of the use of marginal land and the intensifying of the use of favourable land as a result of a change in agricultural practices.

In Vals, meadows which are too steep or too stony for mechanised cultivation are abandoned, giving rise to an increasing risk of erosion and snow-slip. The few level meadows are used more intensively. In spite of state subsidies of Fr. 0.3 million a year this process is still going on.

A landscape map should show how all the aspects of a landscape: geomorphology, altitudinal belts, land use, soil and vegetation are connected. Land use and altitudinal belts are the base of our landscape map. Besides other aspects may play a part. Each mapping unit consists of a mosaic of homogeneous oecosystems, of which we described about 100 types on the basis of soil profiles and vegetation descriptions. Special attention was given to abandoned grasslands: areas with young *Calluna*, *Vaccinium* and *Picea* seedlings or with increased erosion risk were mapped and studied in detail.

Four alternative land management plans were made, based on types of agriculture differing in their degree of mechanisation. A land evaluation map was made with steepness and stonyness as limiting factors: only 320 ha out of the 800 ha meadow land is suitable for mechanisation.

With much unsuitable (labour-intensive) land in use, a farmer cannot keep enough cows to gain a reasonable income: state subsidies should be high in that case. In our plans the amounts vary from Fr. 2.3 via Fr. 0.5 million a year to zero.

Environmental influences have been evaluated for all plans.

P. J. A. M. SMEETS *(Afdeling Geobotanie, Toernooiveld, 6525 ED Nijmegen)*

Vegetation changes in a moist grassland following draining

The vegetation of a small grassland area in the southern part of the Netherlands was studied in 1965 and 1976. Until 1970 the grassland was subject to frequent flooding by the eutrophied water of a river running nearby. Since 1970 the flooding has stopped as a result of canalisation of the river. In 1965 the grassland showed a clear gradient in the vegetation from the lowest-lying eutrophic Phragmitetea communities nearest to the river, via mesothrophic Molinietalia communities in the middle part, to the oligothrophic Junco-Molinion communities furthest away from the river. In 1976 this gradient was still recognizable though it had considerably faded. Comparison of phytosociological tables, vegetation maps and principal components ordinations based on the data of 1965 and 1976 show the extent of the changes. Indicator values of species are used to demonstrate the main ecological factors operative in the area. Changes in pattern and "grain size" of the vegetation maps have been analysed, and the dynamics of the communities are discussed.

A full account will be published in "Biological Conservation", 1980.

TOKE DE WIT and ELISABETH JANSEN *(Rijksinstituut voor Natuurbeheer, Postbus 46, 3956 ZR Leersum)*

Decline of Cantharellus cibarius in The Netherlands

From an inquiry among mycologists and many others it appeared that *Cantharellus cibarius* has decreased considerably in The Netherlands in the last decades. Field work showed that *C. cibarius* is a species occurring in *Pinus* plantations, *Quercus* shrubs, girdles of *Betula* sp., *Quercus rubra* or *Fagus sylvaticus* and almost always on poor sandy soils (mainly blown sand) with, simplified, a very thin layer of humus (< 4 cm), a pH $> 4{,}0$, and less than 10–15% organic matter in the upper soil layer. This indicates a habitat that can be characterized as an early phase of the succession of woodland on poor soils of blown sand. This type of woodland was very abundant in The Netherlands in the 1950's, when many *Pinus* plantations had the right age for *C. cibarius*, as they had been planted in the thirties. Nowadays these woods have become too "rich" for this mushroom species. Another factor may also have had an adverse effect on *C. cibarius*, as it disappeared in the same places where epiphytic lichens disappeared: 60% of the disappeared *C. cibarius* sites coincide with lichen poorness, while none of

the recent *C. cibarius* sites do. This might suggest a relationship between the disappearance of *C. cibarius* and air pollution, the main cause of lichen poorness (DE WIT 1976). This and related problems will be studied further.

WIT, TOKE DE (1976): *Epiphytic lichens and air pollution in The Netherlands.* Cramer, Vaduz. 230 p.

T. W. KUYPER *(Afdeling Geobotanie, Toernooiveld, 6525 ED Nijmegen)*

Syntaxonomy of wet grasslands in the eastern parts of Austria

MEETING OF THE SECTION FOR PLANT MORPHOLOGY AND ANATOMY AND OF THE SECTION FOR PLANT TAXONOMY AND PHYTOGEOGRAPHY ON FEBRUARY 22, 1980

The subject matter of the papers read during the meeting will all be published *in extenso* in the volume on Loganiaceae in the second edition of Engler & Prantl's Natürliche Pflanzenfamilien (Volume 22, in the Press).

A. J. M. LEEUWENBERG *(Vakgroep Plantensystematiek en -geografie, Generaal Foulkesweg 37, 6703 BL Wageningen)*

Relationships within the Loganiaceae and of the family with other taxa

A. M. W. MENNEGA *(Instituut voor Systematische Plantkunde, Heidelberglaan 2, 3584 CS Utrecht)*

Wood anatomy of the Loganiaceae

Th. J. W. GADELLA *(Vakgroep Populatie- en Evolutiebiologie, Padualaan 8, 3584 CH Utrecht)*

Karyosystematics of the Loganiaceae

N. G. BISSET *(Chelsea College of Science & Technology, Department of Pharmacy, Manresa Road, London SW3, U.K.)*

Phytochemistry of the Loganiaceae

W. PUNT *(Laboratorium voor Palaeobotanie en Palynologie, Heidelberglaan 2, 3584 CS Utrecht)*

Pollen morphology of the Loganiaceae

A. J. M. LEEUWENBERG *(Vakgroep Plantensystematiek en -geografie, Generaal Foulkesweg 37, 6703 BL Wageningen)*

Synthesis of the results of the research by different specialists on the Loganiaceae