in the climate, there is no trace of this in tropical fens. Accordingly their structure resembles that of the coal measures: just as, in the latter, the roots of Sigillaria and of Lepidodendron — the Stigmarias — are found on the floor of the seams, so the trees of tropical fens take root in the subjacent clay. As these trees continue their growth and are not choked by peat-mosses, and broken as in temperate and cold regions, they frequently remain erect, as is the case with many tree-trunks in the coal measures [1]).

In one respect, however, there is a great difference, because the flora of the carboniferous period has been almost completely modified. The ferns alone, which occur sporadically in recent fens, still remind us vaguely of a remotely distant epoque.

Botany. — "*Some brief remarks relating to the communication of* Professor Dr. C. E. A. WICHMANN *on ""fen formations in the East-Indian Archipelago""*". By Dr. S. H. KOORDERS.

In order to supplement the above communication by Prof. Dr. C. E. A. WICHMANN and also to supplement, what has recently been published on the same subject by Dr. E. MOHR of Buitenzorg and Prof. Dr. J. F. NIERMEIJER of Utrecht [2]), I cannot refrain from briefly communicating here a few short remarks, mainly concerned with the botanical side of the subject.

It appears from a letter from the Königliche Geologische Landesanstalt, dated from Berlin on April 28th last, N°. 5026/A, VIII, that a memoir by Prof. Dr. H. POTONIÉ will soon be published, dealing with the extensive tropical fenformations, discovered in 1891 by the IJZERMAN-expedition in the hot plain of Sumatra; at the time of writing the manuscript was ready for publication.

The principal contents of this letter were as follows:

"Anbei erhalten Sie Ihrem Wunsch gemäss Ihre Bleistiftskizze der mikroskopischen Zusammensetzung des sumatranischen Tropentorfes mit dem verbindlichsten Dank zurück und ebenso den Brief des

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[1]) Since the same tree species which occur in tropical fens, are also found on the surrounding dry land, it is not necessary to regard the Sigillarias, Lepidodendrons and Calamites as bog plants.

[2]) MOHR, Dr. E., in Bulletin du Departement de l'Agriculture Buitenzorg (1908).

NIERMEIJER, Prof. Dr. J. F., Rede bij de aanvaarding v/h Hoogleeraarsambt i/d aardrijkskunde van N. Oost-Indië aan de Rijks-Universiteit te Utrecht (1908).

KOORDERS in POTONIÉ, Prof. Dr. H., Ein von der Holländisch-Indischen Sumatra-Expedition entdecktes Tropenmoor (in Naturwiss. Wochenschrift 20 Oct. 1907 nr. 42, p. 657.

Residenten von Sumatras Ostküste. Ihre mikroskopische Skizze befindet sich in einer Kopie zum klischieren bei unserem Zinkographen zusammen mit den anderen für den Artikel unseres Landesgeologen Professor POTONIÉ bestimmten Figurenvorlagen. Exemplare des Aufsatzes über das sumatranische Tropenmoor im Vergleich mit den Karbonmooren können wir Ihnen noch nicht zustellen, da der im Manuscript vollständig fertig vorliegende Aufsatz erst in Druck gegeben wird, wenn die Klischeeabzüge vorliegen werden. Der Druck soll nach Möglichkeit beschleunigt werden" (msc. 28 April 1909).

The microscopical drawing, referred to in the above letter of the Kgl. Geol. Landesanstalt, was made by me at Leiden on Oct. 31, 1908, as the result of a preliminary microscopical examination, which I undertook immediately after receiving from India the first specimen of peat from the Sumatran "Tropenmoor", referred to above.

This Sumatran tropical peat was collected at my request on June 29—July 1 1908 by Mr. J. G. LARIVE, civil officer (Controleur) for the division Kamperkiri on the East coast of Sumatra. A copy of the log of Mr. J. G. LARIVE's journey, which I have received, and some data concerning the same district, taken from my own log of March 1891, will be presented by me to the Royal Dutch Geographical Society of Amsterdam, soon after the publication of Prof. POTONIÉ's forth-coming memoir. Meanwhile this memoir will contain a part of a German translation of Mr. J. G. LARIVE's log, which translation was prepared by me and was already sent to Professor POTONIÉ last year.

This tropical peat from the fen formations, discovered in 1891 by the IJZERMAN-expedition in Central Sumatra, was collected at my request and according to my indications by Mr. J. G. LARIVE as the result of an invitation addressed to me by Prof. POTONIÉ in June 1907 at a meeting of the *Botanischen Vereins der Provinz Brandenburg* in Dahlem-Berlin.

My request was transmitted to Mr. LARIVE through the much-valued agency of General G. M. BLECKMANN (at that time colonel of infantry at Soerabaja).

As I naturally wish to postpone my detailed communication to the Royal Dutch Geographical Society until Prof. POTONIÉ will have published his investigation of the tropical peat specimens, I limit myself here to the above brief remarks.

Meanwhile I wish to express my hearty thanks to Mr. J. G. LARIVE, who quite disinterestedly and on behalf of science was good enough to undertake the labour of a very difficult journey. In accordance with my wish, Mr. LARIVE collected the specimens personally at the

same spot, where I found a fen stratum of 8 metres thickness, on March 20—21 1891 at the time of the IJzerman-expedition.

At the same time I tender my hearty thanks to my friend, General G. M. Bleckmann, for his kind assistance, by which my request was transmitted to Mr. J. G. Larive through the valuable intervention to the Resident of Sumatra's East coast.

Leiden, May 29th 1909.

Physics. — *"On Phosphorescence at very low temperatures."* By Henri and Jean Becquerel, and H. Kamerlingh Onnes. Communication N°. 110^a from the Physical Laboratory, Leiden.

(Communicated in the meeting of April 23, 1909).

§ 1. *Introduction.* It is known that in the case of the salts of the rare earths both in their crystalline form and in solution, absorption spectra with particularly clear and fine lines can be obtained by the application of very low temperatures, and that the investigation of the optical and magneto-optical properties of these substances at the temperatures which can be reached by means of liquid air and liquid hydrogen opens up a new method for the study of selective absorption [1]).

A problem, not less important than this, is that of the emission of light at temperatures below that of beginning incandescence. For certain substances, such as the *uranylsalts* [2]), there exists such an intimate connection between the bands in the emission spectra of their phosphorescence and the bands of their absorption spectra, that their distribution in each spectrum follows the same law, so that the bands in the one spectrum form the continuation of those in the other, while they have even two bands in common. Any peculiarity in the occurrence of one of the bands in any of the compounds periodically recurs in all the other bands, as well in the emission as in the absorption spectrum.

Thus, when the absorption spectrum of any of the uranyl compounds

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[1]) Jean Becquerel Compt. Rend. 1906, 1907, 1908, 1909. le Radium t. IV. p. 49, p. 107, p. 328, p. 383. t. V p. 5; Physik. Zeitschr. t. VIII p. 632, p. 929. Jean Becquerel and H. Kamerlingh Onnes, These Proc. Febr. 1908. p. 592. Comm. fr. the physic. Labor. at. Leiden n°. 103. Compt. Rend. t. CXLVI p. 625. le Radium t. V p. 227.

[2]) Edmond Becquerel Mém. de l'Ac. d. Sciences t. XL. Ann de Ch. et de Phys. 5e ser t. X p. 5. Henri Becquerel Compt. Rend. t. CI 1885 p. 1252.