

te Heerlen, woensdag 14 mei 1958.

Br. Arnoud vertelt het een en ander over de bouw van hooiwagens schorpioenen en spinnen en geeft in grote trekken hun verschillen weer. Verder wijst hij er op, dat overal natuurschoon verdwijnt of dreigt te verdwijnen, zo o.a. in het stroomgebied van de Roode beek door omlegging en te Heerlen in de buurt van de Caumerbeek, waar een poeltje, waarin verschillende salamanders voorkomen, gedempt werd. Tenslotte deelt hij mede de Zwarte Specht te hebben waargenomen en wel op 23 april — op het gehoor — in de omgeving van Heihof en op 30 april zag hij de vogel rond vliegen komende van de hei links van de Rimbürgerweg, ongeveer 10 minuten gaans van Abdissenhof - Brunssum. Hierop vermeldt de heer Bult een groot aantal interessante waarnemingen van vogels en belooft hierop later te zullen terugkomen. Dr. Dijkstra vertelt over het bezoek van een chauffeur van een vrachtwagen, welke hem vol trots een paddestoel liet zien, die groeide in de sponning van de voorruit. Het merkwaardige is, dat deze gedurende 5 of 6 jaar, ieder jaar omstreeks dezelfde tijd, te voorschijn komt. Het mycelium moet dus minstens even oud zijn en een minimum aan eisen stellen, bestendig zijn tegen benzinedampen en grote temperatuurschommelingen kunnen verdragen.

NIEUWS UIT VENLO EN OMGEVING.

De heer A. J. Pijpers schrijft ons:

Op 1 juni van dit jaar werd bij het Zwarte-water bij Venlo een ringslang gevangen, een mooi, groot, volwassen exemplaar van $\pm$ een meter lang.

Daar de ringslang in Limburg zeker niet algemeen is, vermelden wij dit.

Wie kent nog andere goed geconstateerde vondsten uit Limburg?

Ook naar de adder en de gladde slang zijn wij in dit opzicht nieuwsgierig. Wij weten, dat beide soorten in Limburg voorkomen, maar uitgebreider kennis is zeer wenselijk. Ik zelf ken enkele vangsten van de gladde slang bij Kessel en bij Sevenum.

FORAMINIFERA FROM THE CRETACEOUS OF LIMBURG, NETHERLANDS. XXXIV.

ON SOME LAGENIDAE OCCURRING IN THE KUNRADE CHALK, SUGGESTING A DANO-PALEOCENE AGE OF THAT CHALK.

by J. HOFKER

In the Kunrade Chalk, which is found resting on the Hervian or on Upped Mb in a large area from the neighbourhood of Kunrade till the surroundings of Geleen, we find many typically reworked species deriving from the Lower Md in the Southern part of the area, and, at its top, in the Northern part, even reworked specimens from the Upper Md and Me; moreover, in the North-Western part (neighbourhood of Geleen) it is covered by typical Lower Paleocene.

This occurrence of reworked specimens of many of the commoner species only found from the Lower Md on, already suggests an age of the Kunrade Chalk younger than that formation. To determine that age planctonic forms cannot be used, since in none of the hundreds of samples of typical Kunrade Chalk planctonic forms were found. The Kunrade Chalk, however, is rich in *Lagenidae* and *Polymorphinidae*, of which the author here some *Lagenidae* will publish which show some data for determination of its age.

1. *Astacolus gryi* Brotzen (1948, Sver. geol. Unders., C, 493, p. 44, pl. 7, fig. 6).

Typical specimens of this species, showing the characteristic elongate test with later chambers somewhat uncoiling and longitudinal costae especially distinct near the sutures and the coiled part, fainter at the end of the test, were found as well as in the type-locality, Kunderberg, as in many other localities. Often several specimens were detected in a single sample.

The species was described by Brotzen from the Lower Paleocene of Sweden, and recently was mentioned by Pozaryska as well from the Danian as from the Lower Paleocene of Poland (Palaeontologia Polonica, No. 8, 1957, p. 99, pl. 19, fig. 1). The specimens do not differ in any character from those described by Brotzen and Pozaryska. Never the species was found in the Maestrichtian.

2. *Robulus discus* Brotzen (l.c., p. 42, pl. 7, fig. 3-5). *Robulus discus* is typical for

its much compressed test, slightly sub-acute margin, 6-9 chambers in the last formed whorl, slightly curved sutures and *Robulus*-aperture. It already occurs in a primitive form, often somewhat irregularly built as a *Darbyella*, in the highest Md and the Me, and was found in many specimens in the Lower Paleocene covering the Md, Me or the Kunrade Chalk. In the Kunrade Chalk the specimens more are alike those found in the Me than those found in the Paleocene. According to Pozaryska (l.c., p. 131) the species occurs in the Danian and the Lower Paleocene of Poland, not in the Maestrichtian.

3. *Vaginulina midwayana* Fox et Ross (Journ. Pal., vol 16, p. 669, 1942; *Vaginulina robusta* Plummer, Texas Univ. Bull., No. 2644, p. 112, pl. 6, fig. 4).

This species shows characters which may point to a derivation from *Marginulina trilobata* Reuss, a species which is common in the whole Upper Senonian, and which begins to change its characters in the Cr 4 in Holland; during the sedimentation of the Maestrichtian Chalk Tuff only very rare specimens were deposited, but in the Kunrade Chalk specimens occur which show the typical pustulate and thickened sutures characteristic of this Paleocene form. According to Cushman (1951, Geol. Surv. Prof. Paper 232, p. 28) the species is an excellent guide-fossil for the American Paleocene. Specimens observed in the Kunrade Chalk do not differ from specimens found in samples from the Midway Formation.

4. *Saracenaria trigonata* (Plummer) Cushman (Cushman Lab. For. Res., Contr. vol 16, p. 61, pl. 9, fig. 31). This very typical much elongate *Saracenaria* with its carenate margin at the septal face which is very long, are reported from the Paleocene of America; it may be that Franke described it as *Christellaria arcuata* d'Orbigny from the Paleocene of Denmark.

5. *Lagena sulcatiformis* Pozaryska et Urbánek (1956, Acta Palaeont. Polonic. vol. 1, pp. 113-134). In this publication Pozaryska and Urbánek give the evolution of this species; it becomes more and more elongate during the Maestrichtian, the Danian and the

Paleocene. All specimens found in the Kunrade Chalk (it is common in many samples) point to Danian, and certainly not to Maestrichtian.

6. *Lagena spiralis* Brady (1884, Challenger Report, p. 468, pl. 114, fig. 9). This small species never is found in the many samples observed from the Upper Maestrichtian and the Maestrichtian Chalk Tuff; it was found in the Danian by Pozaryska.

7. *Fronicularia* cf. *biformis* Marsson (1878, p. 237, pl. 2, fig. 17).

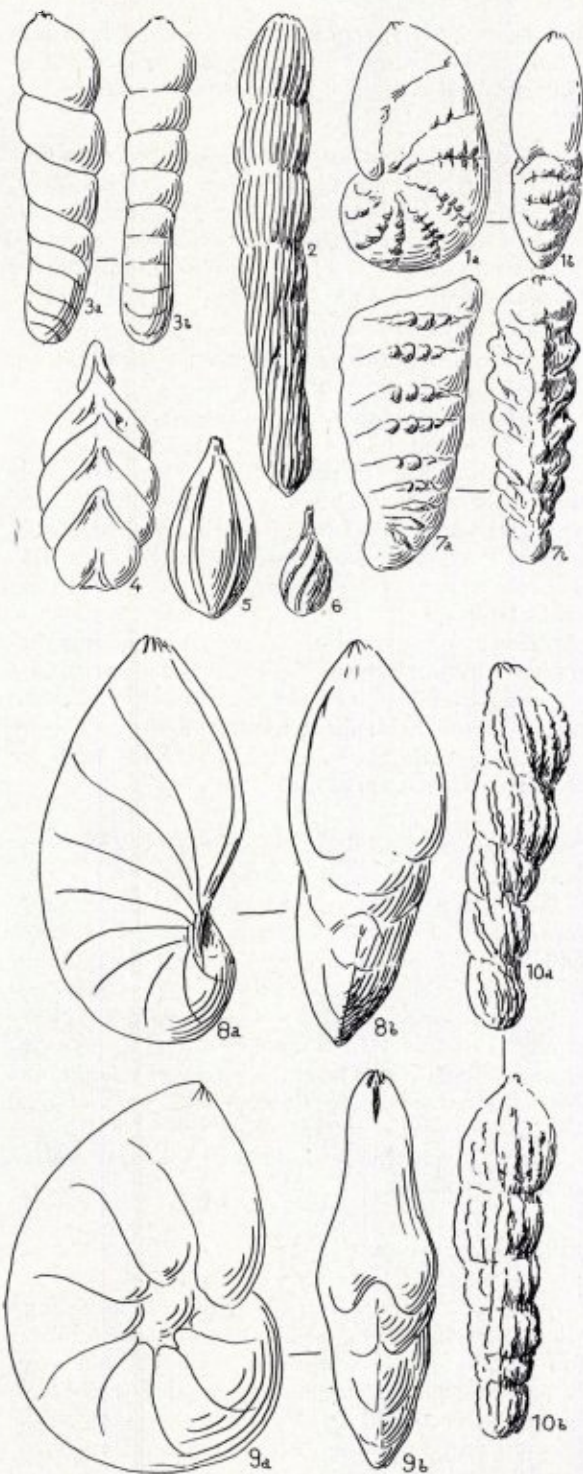
Fronicularia sp. Cushman, (1951, l.c., p. 31, pl. 9, fig. 6).

Fronicularia biformis Marsson is a common species in the Maestrichtian of Holland and Germany. It vanishes in the Maestrichtian Chalk Tuff. But in the Me and the Lower Paleocene, also in the Tuffeau de Ciply in Belgium and Holland, a species reappears which is slightly different; the tests are smaller, and distinctly thinner, often with a very small last formed chamber. These specimens also are found in the Kunrade Chalk, and they also are common in the Paleocene of America and the Danian of Denmark.

8. *Dentalina obliqua* (Linné) (1758, Syst. Nat., p. 710, pl. 19, fig. n-m).

According to Pozaryska (l.c., p. 86, pl. 8, fig. 6, 10) a species, common in the uppermost Md, the Me and the Lower Paleocene belongs to Linné's form; it may be that it is identical with *Dentalina pseudo oblique-striata* (Plummer). Pozaryska mentions it as „peu nombreuse au Maestrichtien, elle devient commune dans le Danien et au Paléocène". Very typical specimens occur in the Kunrade Chalk, not differing from those found in the Lower Paleocene of Holland.

9. *Marginulina plummerae* Cushman (1837, Contr. Cushman Lab. For. Res., vol. 13, p. 97, pl. 13, fig. 21-23). This *Marginulina* with slightly compressed test, first oblique sutures not depressed, last formed chambers more inflated and here oblique sutures more depressed, has been recorded by Pozaryska from the Danian and Paleocene of Poland, and are mentioned from the Paleocene of Trinidad.

10. *Marginulina costatula* nov. spec.

Marginulina spec. B, Cushman 1951, l.c., p. 18, pl. 5, fig. 32, 33.

Marginulina cf. *armata* Reuss, Pozaryska 1957, l.c., p. 105, pl. 11, fig. 13.

A small and delicate *Marginulina* with longitudinal rows of fine punctae often coalescing into fine ribs, the last formed chamber mostly with fine spines, is common in the uppermost Md, the Me and often occurs in the Kunrade samples. It mostly consists of 2-5 chambers. Pozaryska mentions it from Danian and Lower Paleocene of Poland, Cushman from the Midway Formation in America.

These 10 species of *Lagenidae*, found in samples of typical Kunrade Chalk of South Limburg, strongly suggest that the Kunrade Chalk, containing a multitude of reworked species from the Md of the Maestrichtian Chalk Tuff, must be of Danian or Lower Paleocene age. This age is confirmed by the fact, that in the North of the region the Kunrade Chalk is covered by typical Lower Paleocene, and that several species found in the Kunrade Chalk continue their evolution in that Paleocene above.

Figures.

Fig. 1. *Astacolus gryi* Brotzen; drill-hole S.M. XVII, 242-242,50 m; $\times 17$. a, side view; b, apertural face.

Fig. 2. *Dentalina obliqua* (Linné) Pozaryska; drill-hole S.M.XV 183-184 m; $\times 17$.

Fig. 3. *Marginulina plummerae* Cushman; shaft mine Maurits III, 244 m; $\times 17$. a, side view; b, fore side.

Fig. 4. *Frondicularia* cf. *biformis* Marsson; drill-hole S.M.XV, 183-184 m; $\times 34$.

Fig. 5. *Lagena sulcatiformis* Pozaryska et Urbanek; Kunderberg, C 2, No. 76; $\times 70$.

Fig. 6. *Lagena spiralis* Brady; Kunderberg, 2,50 m from top; $\times 60$.

Fig. 7. *Vaginulina midwayana* Fox et Ross; drill-hole 901; at 33,50 m; $\times 34$. a, side view; b, fore side.

Fig. 8. *Saracenaria trigonata* (Plummer) Cushman; drill-hole 901; at 33,50 m; $\times 50$.

Fig. 9. *Robulus discus* Brotzen; shaft Maurits III, 231 m; $\times 29$. a, side view; b, apertural face.

Fig. 10. *Marginulina costulata* nov. spec; Kunderberg, 2,50 m from top; $\times 50$. a, side view; b, fore side.