

ON THE OCCURENCE OF CRANIA BRATTENBURGICA (V. SCHLOTHEIM 1820)
IN THE REGION OF MAASTRICHT (NETHERLANDS).*)
(BRACHIOPODA, INARTICULATA)

E. M. KRUYTZER and M. MEIJER

(Natuurhistorisch Museum, Maastricht)

(Laboratoire de Paléontologie animale, Liège).

Samenvatting: In onderstaand artikel geven schrijvers een beschouwing over de brachiopodensoort *Crania brattenburgica* (von Schlotheim) van het Danien van Denemarken en Zweden. Aanleiding hiertoe is de ontdekking door een hunner, in de bovenste lagen van het tufkrijt in de omgeving van Maastricht, van een groot aantal *Crania*'s, die een opmerkelijke overeenkomst vertonen met de Deense soort.

Bij nader onderzoek bleek, dat, hoewel onze *Crania* inderdaad tot deze soort gerekend moest worden, wij toch te doen hadden met een andere populatie: terwijl bij de Deense populatie bij de overgrote meerderheid der exemplaren de tuberculatie zich uitstrekt over het hele voorveld van de binnenzijde der ventrale schelp, heeft de overgrote meerderheid van onze populatie daarentegen een tuberculatie, die tot de rand van de binnenzijde dier schelp beperkt blijft. Dit verschil in populatie bracht ons er toe onze *Crania* als een afzonderlijke subspecies op te vatten: *Crania brattenburgica geulhemensis*.

Schrijvers zien in het voorkomen van *Crania brattenburgica* in de bovenste lagen van het tufkrijt een aanwijzing in de richting van een mogelijke Danien ouderdom dier lagen, zulks in tegenstelling tot de Paleocéen ouderdom, die Hofker op grond van microforaminiferen hieraan toekent. In een binnenkort te verschijnen artikel komt een hunner op deze kwestie uitvoerig terug.

CRANIA BRATTENBURGICA (von Schlotheim 1820).

- 1820 *Craniolites brattenburgicus* — v. Schlotheim, p. 246, t. 28, fig. 3.
- 1826 *Crania tuberculata*, ex parte — Nilsson, p. 326, t. 2, fig. 3.
- 1827 *Crania tuberculata*. — Nilsson, p. 37, t. 3, fig. 10.
- 1840 *Crania tuberculata*. — Goldfuss, t. 162, fig. 7.
- 1867 *Crania spinulose*. — Lundgren, p. 23.
- 1884 *Crania tuberculata*. — Lundgren, p. 27, t. 1, figs. 19—20.
- 1884 *Crania transversa* ? — Lundgren, p. 25, t. 1, figs. 5—6.
- 1894 *Crania tuberculata*. — Posselt, p. 19.
- 1909 *Crania tuberculata*. — Brünnich Nielsen, p. 149, t. 1, figs. 1—9.
- 1909 *Crania tuberculata* var. *transversa*. — Brünnich Nielsen, p. 151.
- 1920 *Crania tuberculata*. — Rosenkrantz, p. 31, t. 2, figs. 2—3.
- 1920 *Crania tuberculata* var. *transversa*. — Rosenkrantz, p. 31, t. 2, fig. 4.
- 1953 *Crania brattenburgicus*. — Wind, p. 79.
- 1958 *Crania brattenburgicus*. — Carlsson, p. 27, t. 3, figs. 6—7.
- 1958 *Crania brattenburgicus* f. *transversa*. — Carlsson, p. 29, t. 3, fig. 5.

Crania brattenburgica, which occurs in the Danian of Denmark and Sweden, has been found in the Netherlands, viz. in the quarry Curfs, Geulhem, South Limburg (Coll. Natural History Museum, Maastricht, no's 6692—6695) and in Belgium, viz. in the Charbonnage Puits no 2 at Eisdén, Limburg (Coll. Institut Royal des Sciences Naturelles de Belgique, Brussels), in the Upper Chalk of Ciply (Coll. Laboratoire de Paléontologie animale, Liège) and in the cutting of the Albert-canal near Vroenhoven (Coll. M. Meijer, Liège).

We will give now a critical review of the literature on *Crania brattenburgica*.

In 1820 von Schlotheim first published a figure of this species under the name of *Craniolites brattenburgicus* (T. 28, fig. 5). This

had been found in the „Craniakalk” near Copenhagen. The holotype could not be found. A description was not thought necessary by von Schlotheim, since the figure was „genau und richtig” (accurate and correct) (p. 246). Although the figure is not fully correct, we were able to satisfy ourselves from the topo-cotypes collected by von Schlotheim in 1820 that this *Craniolites brattenburgicus* is indeed identical with *Crania tuberculata* Nilsson 1827. These cotypes are in the Geological-Palaeontological Institute of the Berlin Humboldt University (C. 19 and 20 QK 782 Coll. Schlotheim). We

*) The publication of this article has been made possible by the support of the Netherlands Organization for Pure Scientific Research (Z.W.O.).

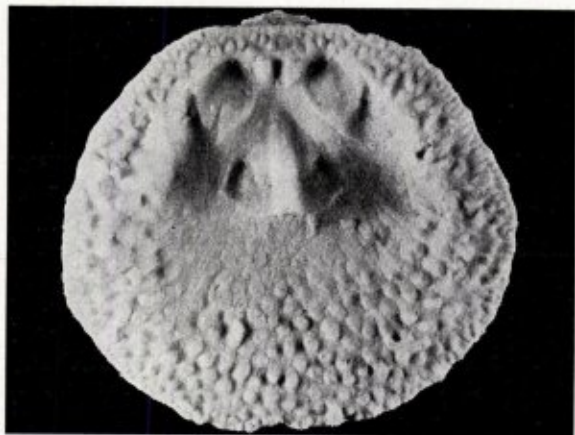


Fig. 1



Fig. 2



Fig. 3

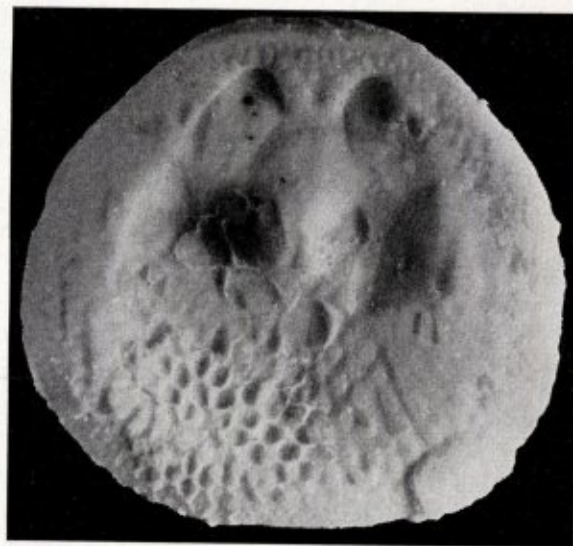


Fig. 4

Fig. 1—4. *Crania brattenburgica brattenburgica* (von Schlotheim), Upper Danian of Denmark.

Fig. 1. Ventral valve $\times 8\frac{1}{2}$. Craniakalk, Herfølge, Zeeland. (Coll. A. Rosenkrantz, Min. Museum, Copenhagen).

Fig. 2. Ventral valve $\times 11$ ibid.

Fig. 3. Ventral valve $\times 8$. M. Upper Danian, Herfølge. (Coll. M. Meijer, Liège).

Fig. 4. Ventral valve $\times 9\frac{1}{2}$. Lower Upper Danian. Chatwinothyris incisa-horizon. Bryozoan limestone, Hvedeland, Fakse. (Coll. A. Rosenkrantz).

Photogr. C. Willemse,

are very grateful to professor Gross and professor Dietrich for placing the cotypes at our disposition.

Of Nilsson's description especially two things are important for us:

1. The shape: oval circular (p. 37). Diameter 15 mm. The specimens shown by him (T. III, fig. 10 A—C) have a width of $13\frac{1}{2}$ mm and a length of $14\frac{1}{2}$ mm. So the difference is slight.

2. The inner surface of the ventral valve: both border and disk are provided with tubercles (p. 38).

Posselt (1894) endorses both of Nilsson's points, however, among the Danish specimens he found less strongly granulated specimens, indeed specimens in which granulation was limited to the border. He is, however, not sure that these specimens belong to *Crania tuberculata* (p. 20).

In the picture of the typical *Crania tuberculata* from the „Craniakalk” of Herfolge Brünnich Nielsen (1909) shows two ventral valves in which the tuberculation is limited to the border (Tab. I, fig. 2 and 3). In the anterior part of the valve in this case a triangular impression before the median septum and the finger-shaped impressions of the vascular system are clearly visible.

In comparing the specimens found in the Netherlands with the Scandinavian ones we have to confine ourselves to those of the Danian of Denmark, having only Danish specimens at our disposal. However we are grateful to Mr. J. G. Carlsson from Ystad (Sweden) for his interesting publication of the genus *Crania* from the Swedish Cretaceous, as in it we find a good historical survey of the study of *Crania brattenburgica* (1958, p. 28).

As regards Denmark we can dispose of 17 ventral valves from the Upper Danian (Craniakalk” of Herfolge, Zeeland), besides 20 ventral and 7 dorsal valves from the Lower Upper Danian (Coll. A. Rosenkrantz, Mineral. Museum, Copenhagen). Professor A. Rosenkrantz was so kind as to lend us these, for which our sincere thanks, as well for the great interest he has shown in our research.

Lastly we want to express our best thanks to Mr. C. Willemse (Eygelshoven) for the great pains he has taken in providing for the fotos printed in this article.

Comparing *Crania brattenburgica* from the Netherlands with those from Denmark.

According Nilsson's description dorsal and ventral valves have small grains on the outside: „extus subtiliter granulata” (p. 37). In all Danish specimens examined by us those grains have disappeared, whereas of the Netherlands specimens some are still granulated (fig. 6a).

A. Dorsal valve.

This is exactly identical in both and fully answers the description by Posselt (p. 20). Nilsson does not give an accurate description.

Description (fig. 5a): Conical with subcentral vertex. Four circular or oval muscular impressions, identical with those of the other species of *Crania*. The impressions of the posterior pair, the adductor muscles, are widely separated by a broad protuberance or a median process of the cardinal edge. Those of the anterior pair, the diductor muscles, situated towards the centre, are separated by a median septum. The periphery of the valve is formed by a narrow border marked by tubercles. In its anterior part the disk exhibits finger-shaped impressions of the vascular system. These impressions are clearly defined by sigmoidal lists.

Dimensions varied.

Denmark:	average length $7\frac{1}{2}$ mm;
	average breadth $8\frac{1}{2}$ mm.
Netherlands:	average length 7 mm;
	average breadth $7\frac{1}{2}$ mm.

The length-breadth difference is always slight; sometimes there is even no difference. The shape of the shell is always an oval-circular one.

B. Ventral valve

1. Denmark (fig. 1—4).

Description: Valve slightly or very slightly convex, nearly flat.

Interior: Four circular or oval muscular impressions. The impressions of the posterior pair, the adductor muscles, are situated near the cardinal edge and widely separated by two prominent bosses of the cardinal edge. The impressions of the anterior pair, the diductor muscles, are proximated and placed close to the centre,

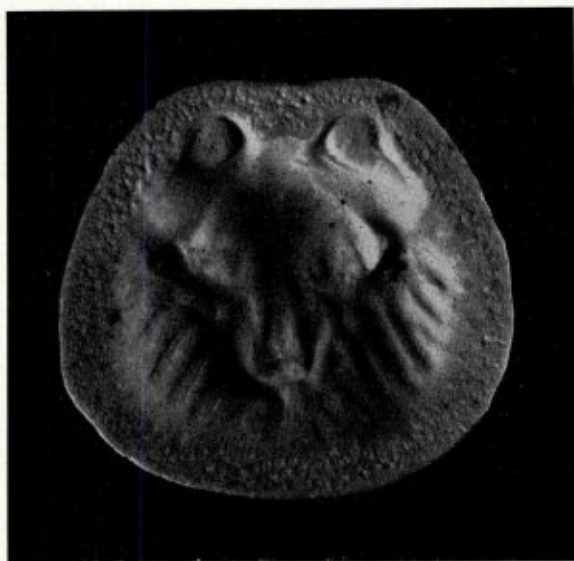


Fig. 5a

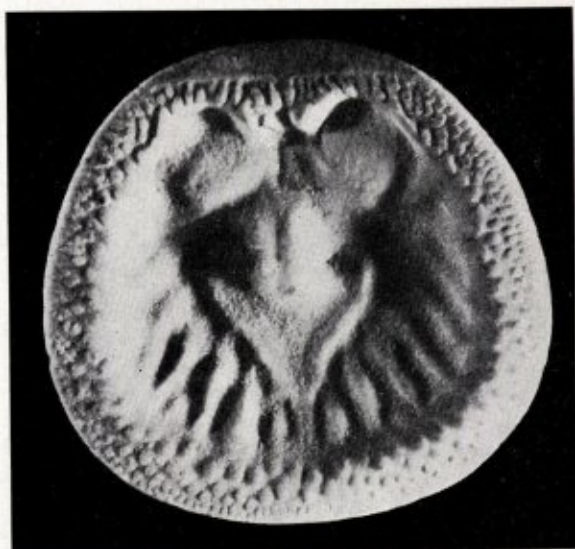


Fig. 5b



Fig. 6a

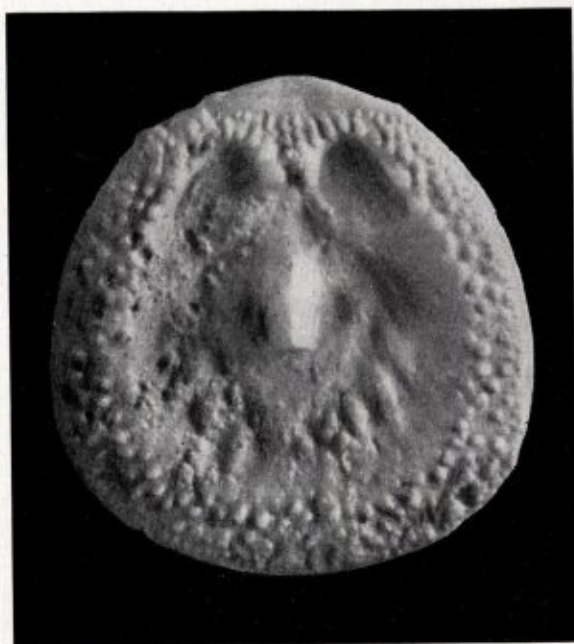


Fig. 6b

Fig. 5—6. *Crania brattenburgica geulhemensis* nov. subspec. Danian of South Limburg, Netherlands. Quarry Curfs, Geulhem, S. E. corner 1956.

Fig. 5a. Dorsal valve $\times 8$; b. Ventral valve $\times 9$. *Holotype*. (Coll. Museum Nat. History, Maastricht, no 6692).

Fig. 6. Ventral valve $\times 8\frac{1}{2}$. a. Exterior side; b. Interior side (Coll. *ibid.* Maastricht no 6693).

Photogr. C. Willemse.



Fig. 7

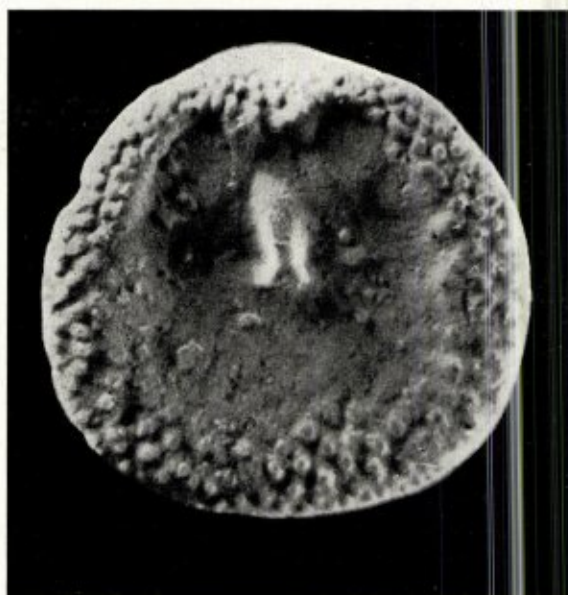


Fig. 8

Fig. 7—8. *Crania brattenburgica geulhemensis* nov. subsp., as in fig. 5—6.

Fig. 7. Ventral valve $\times 12$. Coll. Maastricht, no 6694.

Fig. 8. Ventral valve $\times 10$. Coll. Maastricht, no 6695.

Photogr. C. Willemse.

between which a well developed septum (Rostellum, Hoenninghaus 1828). The periphery of the valve is formed by a thickened broad border marked by tubercles. These tubercles extend beyond the border into the disk and cover up the whole or nearly the whole internal surface of the anterior half of the disk. In several specimens only a few tubercles extend into the disk or the tuberculation is restricted to the border (Br. Nielsen, Tab. I, fig. 2 and 3). In this case a triangular impression before the median septum and the finger-shaped impressions of the vascular system are distinctly visible in the anterior half of the disk.

Among the cotypes of the collection von Schlotheim 1920 (Humboldt University) there is also a specimen in which the disk does not show tubercles.

Dimensions.

Herfolge: varied: 6-9 mm; average length 8 mm, average breadth 8 mm.

Fakse: varied: 7-10 mm; average length 8 mm, average breadth 8 mm.

It is important that in Fakse five specimens have been found of which the breadth is the same as the length, and three in which the length exceeds the breadth; in the others the breadth exceeds the length ($1\frac{1}{2}$ — $1\frac{1}{2}$ mm). All have an oval-circular shape.

In view of the slight difference in length and breadth and the retention of the typical tuberculata-shape, described by Nilsson, there would not seem any reason for distinguishing two varieties with Brünnich Nielsen, viz. the f. *typica* and the f. *transversa*.

There is yet another objection to accepting these two varieties, the fact, namely, that both occur in the same stratum of the same spot, as Rosenkrantz (1920, p. 31) has shown for the Under- and Upper „Craniakalk” of Copenhagen (cfr. Van de Poel, 1956, p. 7).

Whether the *Crania transversa* described by Lundgren (1884, p. 25) for Sweden is really a new species would seem doubtful as yet, since the specimen shown by him (Tab. I, fig. 5, 6) has only a slight difference in length and

breadth. However, we are not able to decide this question.

As for the *Crania transversa* described by Posselt (1894, p. 21) for Denmark, this would seem to us different from *Crania brattenburgica*, since the breadth is much greater (3 mm) here than the length, so that the shell gets an entirely different shape.

2. Netherlands (Geulhem, South Limburg) (fig. 5 b, 6 b, 7, 8).

Description: Valve slightly convex or very slightly convex, nearly flat.

Interior: The posterior half of the disk and the broad border of the disk are identical with those of the specimens of Denmark. In contrast with Denmark the disk of the majority is free from tubercles, but in several specimens of Geulhem the tubercles extend into the disk of the valve, even the tubercles can cover up the whole or nearly the whole internal surface of the disk.

Dimensions: between 4—11½ mm.

average length and breadth 8 mm.

Here also the same situation as in Denmark, viz. length greater than breadth, breadth greater than length, or length and breadth are equal.

Conclusion.

The dorsal valves of Denmark and the Netherlands are identical. As for the ventral valve there is no difference in shape and dimensions, also in the relation length-breadth or in the figuration of the internal surface of the posterior part of the disk.

The only difference exists in the frequency of the specimens with or without tuberculation of the internal surface of the anterior part of the disk, which difference is very great indeed.

We have here to do with two different populations of the same species, which differ geographically and that is why we think it necessary to distinguish two subspecies, viz.

Crania brattenburgica brattenburgica (von Schlotheim 1820) from the Danian of Denmark: The larger majority of the specimens has tubercles on the anterior part of the internal surface of the ventral disk, and only a few have them restricted to the border. There are intermedial forms between the two.

Crania brattenburgica geulhemensis nov. sub-

sp. from the Netherlands: the larger majority of the specimens has the tuberculation limited to the border, the internal surface of the disk of the ventral valve is without tubercles, whereas in only few specimens the tuberculation extends to the disk. There are also intermedial forms.

Holotype from the quarry Curfs, Geulhem, S. E. corner 30 cm under the top of the chalk, collected in 1956 by M. Meijer. In collection Maastricht Natural History Museum no 6692.

Paratypes: Several specimens, same date as type, in coll. Maastricht, nos 6693—6695, and in collection Meijer, Liège.

The specimens found near Vroenhoven (Belgium) belong also to the new subspecies. As to the specimens found in other spots in Belgium it is not possible to state the subspecies they belong to, only a few specimens having been found, but in view of the slight distance from the find-spots, we think it probable that we have to do with the same subspecies.

Stratigraphy.

Crania brattenburgica geulhemensis occurs at Geulhem and at Vroenhoven in the uppermost part of the tuffaceous chalk, which part has generally been considered as to belong to the Maastrichtian of Dumont.

Recent investigations, however, have shown that the uppermost 6—8 meters of the tuffaceous chalk are separated on these localities from the underlying tuffaceous chalk by a typical hard ground or other phenomena, and that this upper part must be considered as to be of Post-Maastrichtian age.

In a paper, in the press now, one of us will deal further with the stratigraphical position of the strata exposed on these sites.

In Geulhem *Cr. brattenburgica geulhemensis* occurs first in holes in the hard ground mentioned above. These specimens are slightly smaller than the types, but for the rest identical with them. The latter come from a layer at about 7½ m above what is now considered as the top of the Maastrichtian. This level yielded hundreds of specimens, but few other fossils, and so reminds of the „Craniakalk” of Denmark.

In Vroenhoven our *Crania* has been collected just above the first hard layer covering a glauconitic tuffaceous chalk, at about 4 meters above the top of the Maastrichtian. Here, it is much less frequent as in Geulhem.

As to the specimens from puits no 2 du charbonnage d'Eysden, Vincent records them at 241, 246, 250 and 251 meters depth, that is respectively 14, 9, 5 and 4 meters above the level where this author puts the top of the Maas-trichtian (at 255 meters).

The fact, that *Crania brattenburgica geulhemensis* has never been found until now at a lower level, i.e. in the Maastrichtian tuffaceous chalk, makes it a valuable marker for the upper strata in the region of Maastricht.

The presence of *Crania brattenburgica* (von Schlotheim) suggests a possible connection of the latter and the Danish Danian. The many *Tylocidaris* spines found at this level also point that way.

Convincing evidence, however, is given by the associated planktonic microfauna, which, as will be shown by one of us (Meijer 1959), shows such a Danian character that no doubt can exist any more as regards the age of the strata we are concerned with here, in contrast with the opinion of Hofker, who on account of the micro-foraminiferal-fauna ascribes a Paleocene age to these strata.

Further investigations, both stratigraphical and palaeontological, will show which part of the Danian is represented here.

Literature

- Carlsson, J. G., 1958 — Le genre *Crania* du terrain crétacé de la Suède. Lunds Universitets Arsskrift. N. F. Avd. Bd 54, Nr 8.
- Goldfuss, A. 1826—1844 — Petrefacta Germaniae. Düsseldorf.
- Hoeninghaus, F. W. 1828 — Beitrag zur Monographie der Gattung *Crania*. Crefeld.
- Hofker, J. 1955 — Ontdekking van een nog niet bekende geologische formatie in Zuid-Limburg (with english summary). Natuurhist. Maandbl. 44, no 7-8.
- 1956. — Het onder-Palaeoceen van Zuid-Limburg (with english summary). Ibid. 45, no 11-12.
- 1957. — Een nieuwe laag in het bovenste krijt van Zuid-Limburg (with english summary). Ibid. 46, no 9-10.
- Lundgren, B. 1867 — Paleontologische iakttagelser ofver Faxekalken pa Limhamn. Lunds Universitets Arsskrift 3, Lund.
- 1884 — Undersokningar ofver brachiopoderna i Sveriges kritsystem. Ibid. 20 (1883—1884), Lund.
- Meijer, M. (in the press) — Sur la limite supérieure du Maastrichtien dans la région-type. Ac. Roy. Belg. Cl. Sc. 1959.
- Nielsen, K. Brünnich, 1909 — Brachiopoderne i Danmarks Kridtaflejringer. Kgl. Danske Videns-

kabernes Selskabs Skrifter, 7 Afd. VI 4. Kobenhavn 1912.

- Nilsson, S. 1826 — Brattenburgspenningen och dess samläktingar i zoologiskt och geologisk afseende undersökte. Kgl. Vet. Ak. Handl. för 1825. Stockholm.
- 1827 — Petrificata suecana formationis cretaceae, Pars prior. Londini Gothorum.
- Poel, Luc. van de 1956 — Faune malacologique du Hervien. Première note. Bulletin Institut royal des Sciences naturelles de Belgique. T. XXXII, no 18.
- Posselt, H. J. 1894 — Brachiopoderne i den danske Kridtformation. Danmarks geolog. Unders. R II 4, Kjobenhavn.
- Rosenkrantz, A., 1920 — Craniakalk fra Kjobenhavns Sydhavn. Danmarks geolog. Unders. R. II 38, Kjobenhavn.
- Schlotheim, E. F. von. 1820 — Die Petrefaktenkunde. Gotha.
- Vincent, E. 1928 — Observations des couches montiennes traversées au puits no 2 du charbonnage d'Eysden près de Maaseyk. Ac. Roy. Belg. Bull. Cl. Sc. (5) tome XIV, no 10-11.
- Wind, J. 1953 — Kridtaflejringer i Jylland. Flora og Fauna 59, Aarhus.

UITGEROEIDE DIEREN, SLACHTOFFERS VAN DE MODERNE BESCHAVING.

door P. J. VAN NIEUWENHOVEN

De mens is toch wel het meest bloeddorstige en genadeloze wezen, dat op God's aarde rondloopt. Overal waar hij zijn heerschappij vestigt, worden de redeloze schepselen in hun voortbestaan bedreigd. En vaak gaat de vervolgingswoede van ons mensen, zo ver, dat wij bepaalde dieren geheel uitroeien. Zo iets komt in de vrije natuur nooit voor! Zelfs de geheel ten onrechte om hun wrede bloeddorst bekende roofdieren slagen daarin niet. Wanneer de door hen gejaagde prooidieren in aantal achteruit gaan, loopt het aantal rovers ook terug, zodat de eerste de kans krijgen zich weer te herstellen. Daardoor komt het, dat in een bepaalde streek zowel het aantal van de prooidieren als ook het aantal roofdieren geregeld aan schommelingen onderhevig is. Tot een algeheel verdwijnen van de prooidieren komt het echter nooit.

Door de mens uitgeroeide diersoorten zijn in de geschiedenis van de westerse beschaving al te zeer bekend. Om het verdwijnen van sommige van hen mogen wij eigenlijk niet treuren. In dicht bevolkte gebieden is uiteraard geen plaats voor