

Geology. — *Jurassic in the island of Sumba.* By P. M. ROGGEVEEN.
(Communicated by Prof. L. RUTTEN.)

(Communicated at the meeting of September 29, 1928).

On an excursion through S.W. Sumba on the 8th of June 1910 H. WITKAMP¹⁾ found in campong Umbu Bewe a number of fossil lamellibranchs in sandy layers intercalated in a formation of shales.

Initially he supposed these fossils to be *Inocerami*. G. BOEHM²⁾, however, who received the material from Utrecht for closer examination determined the fossils as *Posidonomya Becheri* Bronn, and on this ground advocated the probability of the occurrence of carboniferous in Sumba. But in the account of his excursion WITKAMP already says, that afterwards BOEHM was in doubt whether this determination was correct. WITKAMP supposes that the formation found by him must be referred to the Upper-Cretaceous. Also BROUWER³⁾ and RUTTEN⁴⁾ have pronounced their opinion that the deposit is presumably of young mesozoic age.

In 1912 WITKAMP presented the Mineralogical-Geological Institute at Utrecht with some more material from the same locality. The investigation of this material, so far unexamined, yielded some new results.

The rocks are dark-grey, more or less sandy shales, mostly somewhat effervescent with hydrochlorid acid. In some layers angular quartz-grains with a calcareous cement predominate.

Beyond the material which consisted chiefly of impressions, I encountered scanty remains of the shell of the lamellibranchs. These fragments are typical of the shell-structure of *Inoceramus*. The outer-layer, namely, is composed of rather large lime-prisms, normal to the shell-surface. Their dimensions slightly vary in various specimens, the greatest length and breadth being about 0,6 mm. and 0.15 mm. Similar, quite analogous shell-structures also presented other *Inocerami*, which were examined for comparison. Of the interior shell-layer thin remains without a distinct structure have been preserved here and there in the troughs between the ribs of the impressions.

¹⁾ H. WITKAMP. Een verkenningstocht over het eiland Soemba. Tijdschr. Kon. Ned. Aardr. Gen. 2de serie XXIX, 1912, XXX, 1913, p. 17.

²⁾ G. BOEHM. *Posidonomya Becheri* in Niederländisch-Indien? Zur Geologie des indo-australischen Archipels VII, Centralblatt f. Miner. Geol. u. Pal., 1911, p. 350—352.

³⁾ H. A. BROUWER. Geologisch overzicht van het Oostelijk gedeelte van de Oost-Indische Archipel. Jaarboek Mijnwezen N. O. I., XLVI, 1917 (1919), Verhandelingen 2de gedeelte, p. 341.

⁴⁾ L. M. R. RUTTEN. Voordrachten over de geologie van Nederlandsch Oost-Indië. Wolters, Groningen 1927, p. 668, 678.

As BOEHM has not given a specific description, I have considered it well to do so here. Our specimens (impressions) are about ten in number, but they are in part very fragmentary. (Vide fig. 1 and photo G. BOEHM 1911, after a cast of plaster).

The shell is oval-shaped, and little convex (the maximum thickness, measured vertically to the plane through the valve-borders, is about $\frac{3}{4}$ c.m. in the figured specimen). The long hinge-line is straight. On its fore-side we find the slightly curved umbo. The largest shell-length,

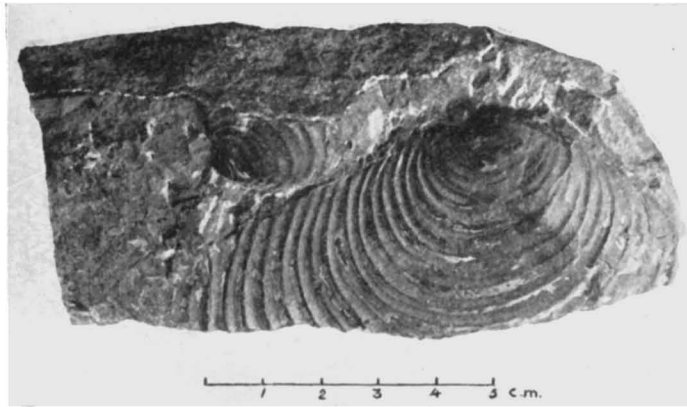


Fig. 1

measured parallel to the hinge-line lies at about the middle of the shell-height. The anterior border of the shell, and the hinge-line encompass an angle of $\pm 135^\circ$. The course of the concentric ribs is generally regular, a single one terminates on the valve. The ribs reach the hinge-line at angles of about 45° , their openings being turned from the umbo. Here the distances between the ribs are smaller than on the valve. In front the ribs run fairly into each other. The distances between the youngest ribs are the largest. The ribs are rather sharp, the troughs on the other hand are rounded. As for ligament-grooves and muscular impressions the available specimens do not admit of observation.

The species above-described differs from the species of the genus *Inoceramus*, so far known from the Dutch-Indian Archipelago.

During the preparation of the lamellibranchs a few other fossils were disclosed, viz. some fish-toothlets and a fragment of an ammonite-shell. According to Prof. L. F. DE BEAUFORT the toothlets may appear to be those of a shark of the family Lamnidae.

The fragment of the ammonite-shell is of greater importance (fig. 2). It is a part of the exterior whorl of an Aegoceratid. The outer portion is provided with a rounded ridge bordered on either side by a shallow groove, lateral of which there occur ribs which gradually pass into nodules. Only in some places indistinct lines of growth may be observed.

Nothing is perceptible of suture lines, Dr. P. KRUIZINGA, who was so kind as to give his opinion about the fragment, deems it not quite im-

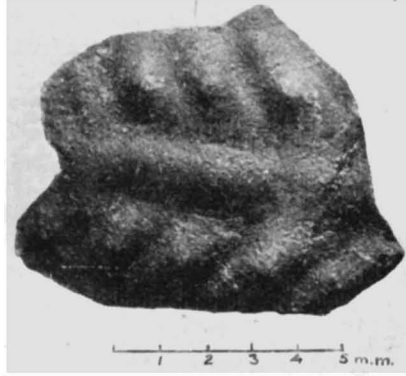


Fig. 2,

possible that it is a young *Hammatoceras Molukkanum* Cloos, described by him from the Jurassic of the Sula-islands.¹⁾ However, considering the very fragmentary character of the remains, and the fact that the resemblance is not complete, it seems to me advisable not to give a specific determination. Together with the ammonite, remains of the *Inoceramus* occur in the same piece of rock. The age of the pretertiary of Umbu Bewe encountered by WITKAMP is established by the occurrence of the *Aegoceratid* as Jurassic.

¹⁾ P. KRUIZINGA. Ammonieten en eenige andere fossielen uit de jurassische afzettingen der Soela Eilanden. Jaarboek Mijnwezen N. O. I., 1925 (1926), Verhandelingen 1ste gedeelte.