

The discovery of macrofossils at Selumar, Belitung, Indonesia

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This note is written in order to record the first discovery of well preserved, in situ, macrofossils on Belitung Island, Indonesia, as well as to provide details of the circumstances of the discovery, the geological environment in which the fossils occur together with a preliminary account of the best fossil specimen that was recovered, and the geological significance of the find.

At Selumar (Fig. 1) a wide essentially magnetite/cassiterite orebody outcrops which elsewhere along the strike was once mined for tin by the Dutch, using underground methods. Early in 1974, when one of us (K.H.) visited the outcrop, it was being exploited by P.N. Timah for jig ragging. This work had exposed a nearly vertical hanging wall which, because of a prominent parting, had developed a few inches inside the ore-body proper. On the broken ore, close to this wall, a well-preserved greyish-white crinoid, partly embedded in the black magnetite-rich ore, was found by K.H. and is described below. Further immediate search, but of short duration, revealed a number of crinoid fragments in the foot-wall, and on the following day a more intensive search by two of us (M.J. & K.H.) resulted in the discovery of still more fragments there. A month or so later further search by M.J. and some of his colleagues recovered another good crinoid specimen from the site, but this has not yet been described.

It is thought that the fossil locality at Selumar may be rather restricted as there is no record of fossils having been found in the underground mine, and it is most unlikely that Dr. Adam, the excellent geologist who was associated with the company that operated the mine, would have failed to record them had they occurred there.

The fossils found at Selumar are all crinoids, and include a well preserved cup with arms (crown), various segments of articulated crinoid stems up to 40 cm long, and many dissociated crinoid elements. They are all referable to a single species of inadunate crinoid of the genus *Moscovocrinus* and even the scattered columnals can be referred satisfactorily to the species. This crinoid has a rather small cup with large plates, long robust arms with many plates, and many thin columnals with large diameter and very large internal opening, giving the stem a resemblance to a pipe and the individual columnals a resemblance to a ring.

The Selumar crinoid appears to be related to *Moscovocrinus multiplex* (Trautschold, 1867) which has been reported in the literature from the Myachkovian Formation (Moscovian = Desmoinesian), U.S.S.R. The only other species currently reported for the genus is *M. Bipinnatus* Lane & Webster, 1966, from the Wolfcampian (Lower Permian) of Nevada, U.S.A. The Selumar crinoids are thought to be Lower Permian in age.



Fig. 1

Macrofossils, Selumar, Belitung

The previous very tentative determination of Stephanian (latest Carboniferous) age plants remains, made by Jongmans and cited by van Overeem, (1960) is probably Permian rather than Carboniferous — and it is questionable if the plants are preserved well enough to be identifiable at all. The fusulinids found along the north coast of Belitung are Permian, and the cassiteritized ammonite (*Agathiceras* sp.) from the southern part of the island is also Permian, but was found as float in a Quaternary placer.

The Selumar crinoids are also remarkable in that they have been replaced by a member of the serpentine group of minerals that is almost certainly antigorite. In this 'antigorite' there are occasional small crystals of magnetite, generally rim-replaced by hematite. The matrix in which the crinoids are embedded consists essentially of comparatively large crystals of magnetite that have been superficially altered to hematite. 'Antigorite', locally with small magnetite/hematite and hematite inclusions, and the rare crystal of cassiterite, occur between the large magnetite crystals.

A discussion of the possible history of replacement of these originally calcitic organic remains, together with the nature and genesis of the Selumar ore-body will form the subject of a later note.

REFERENCES

- LANE, N.G. and WEBSTER, G.D., 1966. New Permian crinoid fauna from southern Nevada; Univ., Calif, Publ. Geol. Sci. V. 63, 87 p., 13 pl.
- OVEREEM, A.J.A., VAN, 1960, The geology of the cassiterite placers of Billiton, Indonesia; *Geologie en Mijnbouw*, vol. 39, no. 10, p. 444–457.
- TRAUTSCHOLD, H., 1867. Einige Crinoideen und andere Tierreste des jungeren Bergkalkes in Gouvernement Moskau: *Soc. imp. Nat. Moskau Bull.*, v. 40, pt. 2, no. 3, pp. 1–49, pls. 1–4.