108. Some Permian Fossils from Southern Kitakami. I

Ichirō Hayasaka

(Comm. by Hisakatsu Yabe, M.J.A., Sept. 12, 1963)

The Permian fossils of southern Kitakami region are by no means scanty in kinds, and there are forms that occur in abundance, as, for instance, brachiopods and corals. When, in 1954, the then known species were tabulated, there were about fifty species of brachiopods and about thirty of corals. Besides, there were several cephalopods, pelecypods and gastropods, not listed in the table. The total known at present amounts almost to a hundred in species, beside fusulinids. The list is being enlarged from time to time by local collectors and geological excursionists.

The writer intends in this note, as well as the others which may follow, to place on record some species that are considered more or less significant paleontologically. Before setting forth the description of fossils, however, the writer considers it not irrelevant to briefly explain the mode of occurrence in general of the Kitakami Permian fossils.

As is evident in the papers on the Kitakami Permian (as well as the older) fossils by the writer and other workers, the specimens are usually strongly crushed and often distorted. Many of them are external molds, many are steinkerns, the latter being occasionally found fitted in the former. Moreover, they are not infrequently detached pieces. Species are not seldom represented by only single specimens.

Having in view the fact that very excellent and abundant fossils occur in the Permian formations in different regions like the Alps, Sicily, Texas, Timor, the Urals and elsewhere, the writer has been embarrassed for a long time with such meager materials to study. The writer believes, however, that even almost unmanageably deformed fossils should not be neglected: they are to be studied as far as possible. Even if specific identification is not possible, some general view of the fauna may, though dimly, be suggested through them. At the same time, records of even such fragmentary specimens might have suggested, or, in a sense, foreshadowed possibilities of further discoveries. Such an attitude may probably be compared to the qualitative analysis in the study of chemistry.

With these lines as a prologue to this note as well as to what may follow, and, at the same time, as an epilogue to the writer's previous papers, a revision of Neoconularia rectangularis (Hayasaka) will be given, based on the observations on a specimen newly acquired
from the same horizon as the original material.

**Genus Neoconularia Sugiyama, 1942.**

7 text-figures

When the writer reported, in 1920, the occurrence of *Conularia rectangularis* from southern Kitakami, it was characterized by (1) the apical angle larger than other apparently similar forms, and (2) the rectangular cross section of the narrow, four-sided pyramid. However, the writer was quite embarrassed that the surface sculpture of the shell was not observed. The rectangular cross section which is by no means rare in Conularids was considered of some taxonomic value in association with that unusual pattern observed on the surface of the steinkern specimen. From the steinkern surface the natural relief of the shell surface can not be inferred unreservedly. As the shell is very thin, the transverse ribs characteristic of Conularid shell may be transverse folds instead of mere surface relief. In that case the surface pattern of the steinkern gives clue to that of the shell. If, otherwise, the transverse ribs are really a surface feature, and if the shell itself is not preserved fossil, then the only way of restoring them is to examine their external molds. This was not realized with the original material of the species.

T. Sugiyama who examined the original specimens in the Institute of Geology and Paleontology, Tōhoku University, Sendai, more in detail, published the result of his observations, describing the species anew in 1942. On account of the unusual characteristics of the species different from the typical forms of Conularids, he proposed to establish a new genus *Neoconularia*.

The pictures of *Conularia rectangularis* (1920) were indeed unfortunate failure of printing. But those given in Sugiyama's paper are very much better to meet his re-description. According to Sugiyama the more important features of the species *Neoconularia rectangularis* are these:— "Neither facial nor secondary facial grooves recognizable, nor is there any trace of the median line demarkating the concentric ornamentation into two parts" and "pyramidal faces with only transverse wrinkles" (p. 392). It is on the steinkern specimens that all these were observed, not on the shell surface. The writer has been more or less skeptical with these points.

Recently, early in 1963, the writer happened to have another specimen of the same species for observation. It belongs to the collection of H. Araki of the City Library of Kesennuma. It is also a steinkern which, though incomplete in preservation, presents more clearly the characteristic features of the species. It is attached to the matrix rock, a shale. On detaching it from the rock, the details
of the external mold were revealed impressed on the rock (Fig. 1a). It is ascertained that the characteristic feature of the shell surface—absence of the transverse ribs and the parietal lines—exactly corresponds with that observed on the surface of the steinkern specimen. The fossil therefore is evidently different from Conularia s. s.

Concerning the surface feature of the shell it seems necessary to
add a few words. On two neighboring pyramid surfaces, faint, curved wrinkles are seen running obliquely down from the longitudinal angle between the surfaces concerned toward the other sides of the respective surfaces: on approaching there they become convergent into almost vertical bundles (Fig. 1a shows this most clearly). The other two surfaces appear to be without such wrinkles (Figs. 1b, 1c). Thus the pyramidal shell has only one plane of symmetry in spite of its quadrate or rectangular outline. This may have some bearing on the mode of growth of the animal.

Sugiyama regarded Neoconularia most likely to belong to anything else than Conulaiellidae in having rectangular cross section and in the absence of the parietal lines. The absence of the transverse ribs do not appear to have been duly appreciated by Sugiyama. The bilateral symmetry was not noticed either.

In the Grundzüge der Paläontologie, I, 1924, Zittel emphasizes, in the diagnosis of the Family Conulariidae Walcott, the following points:—“Jede der vier quergestreiften oder quergerippten Seitenflächen außen durch eine Medianfurche, welcher innen eine vertikale Leiste entspricht, in zwei Hälften geteilt” (p. 506). Shrock and Twenhofel, in their concise but competent description of the “Group Conularida”, including Conulariidae, emphasize the systematic meaning of the surface ornamentation as follows:—“Each of the four lateral faces is generally ornamented with some combination of transverse and longitudinal ridges and furrows, and a prominent furrow typically occupies the edge along which adjacent faces meet.” Thus, it seems plausible to suppose that Conularia rectangularis, that is, Neoconularia, might stand outside the limits of Conularia, and perhaps of Conulariidae.

The new specimen, in distal view, presents an almost lozenge shape of the pyramid instead of a rectangle. However, opposite sides make pairs of different lengths, this perhaps being the result of deformation of the fossil. Longitudinal groove of the angle is not formed in the species.

As an appendix the writer likes to make mention of another specimen which occurred together with the one discussed above. It is also a steinkern, preserving the more apical portion of an individual. Apical angle is also large, being about 20° or rather somewhat more. However, the lateral faces do not show oblique wrinkles but almost plain. Moreover, two of the four angles, opposite in position, are distinctly grooved (Figs. 2a, 2b). Similar grooves seem to have been obliterated along the other angles. It is noteworthy that along one of the grooved angle (Fig. 2b) there are three other longitudinal furrows, though apparently incipient, parallel to the groove of the
angle (Fig. 2b), two on the left side of it and one on the right.

This specimen may or possibly may not be specifically identical with Neoconularia rectangularis: the cross section of the pyramid does not appear to be rectangular.

Locality and Horizon:—Shigeji-iri, Niitsuki, Kesennuma City; lower Kanôkura series.

References

3) Robert R. Shrock and William H. Twenhofel: Principles of Invertebrate Paleontology, p. 120 (1953).