This work indicates that data on enzyme inhibition by clay minerals cannot be applied directly to processes in soil because of its protecting effect.

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The Middle Cambrian Trilobite *Centropleura* in Queensland

THE trilobite genus *Centropleura* Angelin 1854 was established for a Swedish species, *Paradoxides lovénii* Angelin 1851. *Centropleura lovénii* occurs in the Middle Cambrian Andrarum limestone of Scania, Sweden. During the century that followed its first discovery, the genus was found in rocks of the same Middle Cambrian age on Bennett Island in the Arctic Ocean, in northern and eastern Siberia, in the United States in the State of Vermont, and in Canada in the eastern part of the Gaspé Peninsula. It was assumed that *Centropleura* was an 'arctic' and 'subarctic' trilobite.

In all these localities *Centropleura* is rare and is preserved as fragments unsuitable for reconstructing the exoskeleton. Angelin published a reconstruction that has been reproduced from time to time in the subsequent literature. This reconstruction is still incomplete and is, apparently, based on two different species. An almost complete specimen of a related form ("*Anopolenus*") was described from Great Britain. Although this specimen is strongly sheared, it shows an organization different from Angelin's reconstruction of *Centropleura*.

In 1952 and 1954, two species of *Centropleura* were found in Middle Cambrian sediments in Queensland, 6 and 15 miles east from Duchess. One species (the older) occurs in shale and is fragmentary. The other species occurs in limestone and is well preserved. It is slightly younger than the first and is found in the Devoncourt Limestone, the age of which is uppermost Middle Cambrian. This age is indicated by the presence of *Leipyge laevigata* in the Limestone.

From the Devoncourt Limestone numerous fragments and a complete specimen of *Centropleura* were recovered. It is a new species closely related to the Swedish *Centropleura lovénii* (Angelin). The reconstruction of this new species is shown in Fig. 1.

The occurrence of *Centropleura* in tropical Queensland and south of the present equator disposes of the idea of an arctic trilobite with its geographical distribution controlled by climate. The scattered distribution of *Centropleura* merely indicates that the seaways were open almost the world over in Cambrian time.

Centropleura, as seen from the reconstruction (Fig. 1), deviates in its organization from other

Fig. 1. *Centropleura* n.sp. (reconstruction one-third natural size); Devoncourt Limestone, Queensland

trilobites in several ways. Its three posterior thoracic segments are macropleural and are linked with each other and with the pygidium into a rigid, non-articulating unit. This 'pygidial unit' functioned even as a moulting unit, although after moulting it could disintegrate into its four original components. The rigidity of the unit results from the backward curvature of the line of contacts between the posterior tergites, whereas flexibility along the contacts is possible only where they are straight hinge lines, as is seen between the remaining thirteen segments and the cephalon. These thirteen segments also have unusual short pleurae with an extremely narrow doublure. The hour-glass shape of the thorax is unique.

A rostral shield fused with the hypostoma is also preserved.

Centropleura is at present assumed to be a genus of the family Paradoxididae. Its expanded glabella and the character of the posterior glabellar furrows may support this view. However, the structure of the thorax and of the pygidium, the deep interlocking of the free cheeks and cranium, and the advanced position of the cephalic spines, including the intergenal spines, do not support the assumption of a close relationship between *Paradoxides* and *Centropleura*.

A complete description of the new species of *Centropleura* and the associated fossils is in preparation and will be published in a forthcoming bulletin of the Bureau of Mineral Resources, Geology and Geophysics.

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