certaines" (Gall, 1971, p. 55). However, Gall and Grauvogel did erect a subclass for cycloids, the Halicyna, and they clearly believed in biramous trunk limbs.

Glaessner (1969) provided a summary review of the cycloids, but their status within the Crustacea remained uncertain. He also took the opportunity to correct some generic names. Schafhäutl's *Carcinaspis* became *Carcinaspides,* and Stolley's *Cyclocarcinus* changed to *Cyclocarcinides.* Glaessner also sorted the genera known at that time into three families. The Cyclidae contained the more or less flatter forms *Cyclus, Halicyne,* and *Carcinaspides*; the Hemithrochiscidae included the small, highly vaulted taxa *Hemitrochiscus, Cyclocarcinides,* and *Oonocarcinus*; and the peculiar *Mesoprosodon* earned its own family, the Mesoprosopidae.

Clark (1989) conducted the most recent study of *Cyclus* based on material from the Namurian shales of Scotland. He produced a detailed reconstruction of *C. rankini* and, more importantly, attempted the first rigorous character analysis of known *Cyclus* in combination with various other crustaceans, concluding that cycloids belong within the Copepoda.

In addition to the above problems engendered by over a century of taxonomic confusion concerning cycloids among professional paleontologists, confusion also occurs among modern collectors of Mazon Creek fossils about what name to use when referring to their cycloids. These collectors variously call these fossils *Cyclus, Halicyne,* or "trilobitomorphs." Use of the term trilobitomorph harkens to the vague similarity of cycloids (albeit without tails) to forms like the Burgess Shale creatures *Burgessia* or *Waptia.* As to the origin of the confusion among collectors about generic names (though Packard placed his species *americanus* within the genus *Cyclus*), for some time the late Gene Richardson and one of us (FRS) used the generic designation of *Halicyne* for Mazon Creek cycloids. This usage developed from some contacts we had in 1967 with Prof. H. K. Brooks, who mistakenly equated the name *Cyclus* with *Halicyne.* Richardson, before his death, had begun a study of the Mazon Creek cycloids. He recognized that the fauna contained at least three species of cycloids, but remained confused as to their taxonomy and mistaken as to certain details of their anatomy. In point of fact, *Halicyne* differs significantly from *Cyclus,* and we now realize that both genera occur in the Mazon Creek fauna in addition to some previously unrecognized new species.

For this study, we used specimens in the fossil invertebrate collections of the Field Museum of Natural History in Chicago (PE), the Mazon Creek Project at Northeastern Illinois University in Chicago (MCP), the Natural History Museum of Los Angeles County (LACM), the National Museum of Natural History in Washington (USNMP), and the Nationaal Natuurhistorische Museum, Leiden (St).

SYSTEMATIC PALEONTOLOGY

Class MAXILLOPODA Dahl, 1956

Diagnosis.—No more than 12 postcephalic trunk segments, uniramous antennules, at most six thoracic segments, abdomen lacking most or all limbs, heart small and bulbous, with "maxillopodan" naupliar eye with tapetal cells.

Remarks.—This diagnosis comes from that provided for Maxillopoda in Schram (1986), and a few items in the definition (e.g., heart and naupliar eye) do not occur in any known fossils. Many crustacean workers place the Maxillopoda among the most derived of all the crustaceans. The maxillopodans exhibit a clear trend to reduce various parts of the body, often linked to repeated evolution of a parasitic life style. However, the reader should realize that if the number of trunk and thoracic segments in a crustacean does not exceed the respective numbers specified above, then one almost automatically considers it a maxillopodan by default—not a particularly desirable situation.

Subclass HALICYNA Gall and Grauvogel, 1967

Diagnosis.—With only one order recognized at present, the subclass definition is the same as that of the order.

Order CYCLOIDEA Glaessner, 1928.

Diagnosis.—Maxillopodans with flattened bodies, carapace oval to subcircular in outline and typically covering entire body, uniramous antennules large, uniramous antennae reduced in size, antennules and antennae laterally attached on the anteriormost part of the head, abdomen reduced to no more than one or two segments, maxilla and anterior thoracopod(s) developed as geniculate claspers.

Family CYCLIDAE Packard, 1885.

Diagnosis.—Dorsal surface shield-like in appearance and often highly convex; carapace with margin entire or denticulate and with central regions smooth, longitudinally keeled, or papillose; segments underlying carapace appear somewhat radially arranged; abdomen bears terminal, blade-like caudal rami.

Remarks.—The above definition modifies that of Glaessner (1969). The range of structural diversity in carapace form, as well as in genicula number and their anatomical variations in the Mazon Creek cycloids, may in fact be the basis some day for splitting this single family into several. Future discoveries about these features in other genera and species of the cycloids will undoubtedly lead to complete taxonomic revision of the group.

The preservation of these fossils can confuse the casual observer. The carapace can occasionally appear intact (e.g., PE 22462, Figures 1.3, 2.2). More often one or more surfaces of the original body can appear on the same specimen. The dorsal surface of the carapace often breaks away in the central area, displaying portions of the cephalothoracic segments underneath (USNMP 38863, Figure 1.1). One can often see traces of the cephalothoracic limbs impressed from below (e.g., PE 31712, Figure 1.4; PE 22472, Figure 3.4). In some specimens, the lateral portions of the carapace are missing to reveal the lateral portions of the thoracic tergites and limbs PE 34759, Figure 5.4). The ventral surface can also display variations in their preservation, e.g., as a ventral view of the sternites without legs (PE 22478, Figures 6.1,2) or as a ventral view of the legs lying over the sternites (PE 34954, Figure 5.2). Preservation commonly occurs in negative, i.e., a mold of the original (PE 21013, Figure 6.5). Fossils may exhibit variations ranging from three-dimensional preservation of the original form (e.g., PE 22495, Figure 6.3) to mere color differences in the rock (e.g., the antennae on MCP 507, Figure 4.1), or retain a lot of clay mineral such as kaolinite (PE 24959, Figure 3.1) or pyrite (PE 20601, Figure 6.4). Because of the variations in preservation that one can find on these fossils, no one specimen preserves all the anatomy in perfect array. Thus, reconstructions offered by us are composites based on examination of several specimens for each feature. Material actually illustrated here represents only a small portion of what one can see on the 876 specimens available for this study.

Genus CYCLUS de Koninck, 1841.

Diagnosis.—Carapace oval to subcircular except for a large rectangular plate over a frontal extension of cephalon, not very convex and somewhat flattened in lateral or cross-sectional view, surface papillose or smooth, margin either smooth or decorated with fine crenulations. Antennules and antennae attached laterally to frontal extension. Mandibles small and serrate, maxillules small and bearing reflexed palps. Maxillae as large gen-