for those rocks which had been the Lower Silurian of Murchison and the Upper Cambrian of Sedgwick. An approximate cor­relation of the usages of the title “ Silurian” is here given in tabulated form:—

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| --- | --- | --- | --- | --- | --- | --- | --- |
|  | R. I. Murchison. | A. Sedgwick. | C. Lapworth. | American. | A. de Lap parent. | | E. Renevier. |
| Silurian.  (Upper Silurian of some authors.) | d  ¼  5 | Silurian. | Silurian (Salopian). | Niagaran  I (S. D. Dana). Ontaric or Siluric (Emmons, &c.), 1844. |  | Bohemien (2nd ed. *Traité).* Gothlandien (3rd-5th ed.). | **d**  **3 cr**  **U**  **3**  **en** |
| Ordovician. (Lower Silurian of some authors.) | CΛ | d rt  ∈ | Ordovician. | Silurian(Dana).  Champlainic (Hall, Emmons, &c.). | Silurien.  A | Ordovicien. |
| Cambrian. Upper. Muddle. Lower. | Cambrian. | υ | Cambrian. |  |  | <  Cambrien. |  |

The Silurian rocks are almost wholly of marine origin and in­clude all the usual phases of sedimentation; shales and mudstones, marls and limestones, sandstones and grits are all represented in Great Britain and in most other countries where the Silurian is known. The majority of the rocks were deposited in the com­paratively shallow waters of epicontinental seas, the graptolitic shales and sponge-bearing cherts being perhaps the representa­tives of the deeper waters. Locally, glauconitic limestones and ironstones (Clinton beds) indicate special conditions; while the isolation and desiccation of certain marine areas (New York) towards the close of the period gave rise to beds of red sandstone, red marls, gypsum and rock salt. The hydraulic limestone (Water Lime) of New York was probably a brackish-water forma­tion. In Sweden and elsewhere some of the limestones and shales are distinctly bituminous.

*Distribution.*—In the preceding Ordovician period several well- marked marine provinces are indicated by the fossil contents of the rocks. At the beginning of Silurian time a general transgression of the sea—which had commenced at the close of the Ordovician—was in progress in the N. hemisphere (Europe and the Appalachian region). This culminated at the time when the Wenlock beds and their equivalents (Niagaran and Oesel beds) were forming at the bottom of a great periarctic sea or shallow ocean. It is thus found that the same general characters prevail in the Silurian of Britain, N. America, Scandinavia and the Baltic region, Russian Poland (Podolia, Kielce, Galicia), the Arctic regions, New Siberia (Kotelny), Olenk district, Waigatsch, N. Zembla, Tunguska, Greenland, Grinnell Land and China. The Bohemian region, comprising central Bohemia, Thuringia, Fichtelgebirge, Salzburg, Pyrenees, Languedoc, Catalonia, South Spain, Elba and Sardinia, alone retained some of its marked individuality. Later in the period a gradual withdrawal of the sea set in over the N. hemisphere, affecting the British area (except Devon), the left of the Rhine, Norway and the Baltic region, N. Russia, Siberia and the Ural region, Spitzbergen, Greenland and the W. states of N. America. Thus the later Silurian conditions heralded those of the succeeding Devonian and Old Red Sandstone, and there is generally a gradual passage from one set of rocks to the other (Downtonian of Great Britain). The Silurian rocks may occur in close continuity with the upper Ordovician, as in S. Europe; or, as in the typical region, the Llandovery beds may rest unconformably upon older rocks; in N. America also there is a marked uncon­formity on this horizon. A large part of N. America was apparently land during part of Silurian time; the lower members are found in the E. alone, while the Cayaguan division is found to extend farther E. than the middle or Niagaran division, but not so far W. The falls of Niagara owe their existence to the presence of the hard Lockport and Guelph beds resting upon the softer Rochester shales. Most of the essential information as to the distribution of Silurian rocks will be found in a condensed form in the accompanying table and map; but attention may here be drawn to the upper Silurian (Ludlovian) limestone of Cornwallis Island, the mid-Silurian lime­stone of Grinnell Land and the lower Silurian limestone of New Siberia. Limestones of lower and middle Silurian age are found also

*richia* are very abundant locally. A feature of great interest is the first appearance of the remarkable Eurypterid crustacean *Eurypterus,* which occasionally reached the length of over a yard, and of the limulids, *Neolimulus* and *Hemiaspis.* The cephalopods were the predominant molluscs, especially *Orthoceras* and various abbrevi­ated or coiled orthoceras-like forms *(Cyrtoceras, Phragmoceras, Trochoceras, Ascoceras);* there was also a *Nautilus,* and an early form of goniatite has been recorded. Gasteropods include the genera *Platyceras, Murchisonia* and *Bellerophon;* the pteropod *Tentaculites* is very abundant in certain beds. The pelecypods were not very important *(Cypricardinia, Cardiola interrupta, C. cornucopiae).* Next to the cephalopods in importance were the brachiopods: in the lower Silurian pentamerus-like forms still continued *(P. Knightii,*

in Timan, Tunguska and elsewhere in N. Russia. Rocks of this system in S. America have been only superficially studied; they occur in the lower regions of the Amazon, where they bear some resemblance to the Medina and Clinton stages of N. America, and in Bolivia and Peru. Little is known of the Silurian rocks recorded from N. Africa.

*Silurian Life.*—Our know­ledge of the life of this period is limited to the inhabitants of the seas and of the brackish waters of certain districts. The remains of marine organisms are abundant and varied. Graρ- tolites flourished as in the pre­ceding period, but the forms characteristic of the Ordovician gave place early in the Silurian to the single-axis type *(Mono- graptidae)* which prevailed until the close of the period *(Rast- rites, Monograptus, Retiolites* and *Cyrtograptus).* As in the Ordovician rocks, the graρto- lites have been largely em­ployed as zonal indicators. Trilobites were important; the genera *Calymene, Phacops* and *Encrinurus* attained their maxi­mum development; *Proetus, Bronteus, Cyphaspis, Arethusina* may be mentioned from among many other genera. The ostracods *Leperditia* and *Bey-*

P. *oblongus),* but the spire-bearing forms soon began to increase *(Spirifer, Whitfieldia, Meristina, Atrypa).* Other genera include *Rhynchonella, Chonetes, Terebratula, Strophomena, Stricklandinia.* The bryozoa, especially the bulky rock-building forms, were less in evidence than in the Ordovician. The echinoderms were well represented by the crinoids *(Cyathocrinus, Crotalocrinus, Taxocrinus),* some of which are found in a state of beautiful preservation at Dudley in England, Lockport (New York), Waldron (Indiana) in N. America and also in Gothland in the Baltic. Cystids were abundant, but less so than in the Ordovician ; blastoids made their first appear­ance. Corals, mostly tabulate forms, flourished in great abundance in the clearer waters and frequently formed reefs *(Favosites goth- landica, Holy sites catenularia, Alveolites, Heliolites)\*,* tetracorallian forms include *Stauria, Cyathophyllum, Cystiphyllum, Acervularia, Omphyma* and the remarkable *Goniophyllum.* Sponges were repre­sented by *Astylospongia, Aulocopium,* &c. The peculiar genera