|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Approximate Correlation of Silurian Racks.* | | | | | | | | | | | | | | |
| Graptolite Zones (Britain). | England and Wales. | Scotland. | Scandiαaviaα. | Baltic Region. | Bohemia.  ♦ | Western Europe, | E. Alps. | North America (New York). | | Canada. | Nova Scotia. | New  Brunswick. | Asia. | Australia. |
| *ManograPtus hintwarain-* | Downton | Downtønian | Upper *Cardiola* | *Eurypterus* | Stage E2 αf |  |  | Manlius |  |  |  |  |  | δ |
| and | and | beds and upper | beds. | J. Barrande. |  |  | limestone. |  |  |  |  |  |  |
| *en s is.* | Ludlow | Raeherry | Cephalopod or |  |  | S | Rondout |  | i |  |  | 3 | ⅛ ⅛ |
| groups. | Castle | Gothland lime- |  | Limestones |  | 2 | Water Lime. |  |  | £ . | i3 \*g |
| *Μ. bahemicus.* | beds. | stone. |  | with |  | **d** | Cobleskill |  | t |  |  | « S | o∙"i |
|  |  |  |  | cephalopods. |  | jS | limestone. | Lø | à | CX *a* | **∞ § V,** |
| *Μ. Nilssoni.* |  |  | Red sandstone. | Up1grθesel |  |  | Salina beds of | Γ≤ | ⅛ | g |  | ⅛ S S |
|  |  |  | Lower cephalopod |  |  | 8 | Onondaga |  | to | **2** | (∕j  C<w | 5 çn fe ≡f≡s |
|  |  |  | limestone. | dolomite |  | § | with |  | **43** | .≡> | tó | **43 θ** |
|  |  |  | Crinoid and coral | and |  | •l· |  | rock salt |  |  | ë | **. ⅛>**  't3 fl | ι≡m |
|  |  |  | limestone. | limestones. |  | ⅜t | and |  | ,c | 2 | tes c esto | g s⅛ |
|  |  |  |  |  |  |  | 0 | gypsum. |  | § | < | Masce | f cLa |
|  |  |  | Lower *Cardiola* shales and *Mega-* |  |  | f Iherian j N. W. Fra |  |  | Guelph limest | 1 | N S tr≡ | imes1  wit |
| *•* |  |  | *lamus* limestones. |  |  |  |  |  | P |  | &g r ra |  |
| *Μ. testis.* | Wenlock | Riccarton, | *Cyrtograptus* | Lower Oesel | Crinoid | s'®  fl 7> | . | Guelph |  |  |  | 3 |
| nnd | Blair, | shales and lower | heds: | limestones. | 5S | Ί3 | dolomite. |  |  |  |  |  |  |
| *Cyrtograptus* | Wool hope | and | hrachiopod and | dolomite |  | C2 | **tΛ** | Lockport |  |  |  |  |  |
| *Linnarssøni.* | groups. | Straiton | coral limestone | and |  | a § | \*s cβ | < |  |  |  |  |  |
|  | beds. | with sandstone. | marl. |  | ≡∙≡ | limestone. | - | ,∙≡ |  |  | **43** |
| *Cyrtograptus Mur chi so ni.* |  |  |  |  |  | s | Rochester | 0  < | 1 | cñ  ’S |  |  | Limes ti *crinuruj* |
|  |  |  |  |  |  | la | 1 | shales. |  | **0**  < | **43**  **43** |  | h |
|  |  |  |  |  |  | -bearing sh  »tones, shal | ∙≡  •J | Clinton beds. |  | tones of | 1 Went wort | e group. | e Himal∑  1 trilobit | hl |
|  |  |  |  |  |  |  |  |  | ≡ |  |  |  |
| *Rastrites* | Tarannon, | Queensberry | *Rastrites* shales | *Pentamerus* | Stage Ej of | \*>∙S .⅛ β | 1 ■ |  |  | J | 0 | **g** | **~ cd Ο Λ** |  |
| *maximus.* | Llandovery, | beds. | and *Strickland-* | beds. | J. Barrande. |  | Medina ' | ⅛ |  | c | ∙⅛  jß | sΕ | rf 5 |
|  | and |  | *inia* marls. |  | Graptolite | a | 8 e | sandstone. |  | **cd** | gg∙ | tone dth Vict |
| *Μ. spinigerus.* | May Hill | Birkhill shales |  |  | shales | 8 | tíc sha' limestc | Oneida | 0 » M | §· | **cd fl** | *Pi* |  |
| groups. | and |  |  | with | 0 | **τ□** | U |  | .is  — u□ | 8 So |
| *Μ. gregarius.* | Graρtolitic beds |  |  | diabase |  | conglomerate. | ⅛ | § | ⅛ |  |  |
|  |  | of the |  |  | at the base. |  | -5 X |  | 8 |  |  |  |  | Bg lí  1 olit< |
| *Diplagraptus* |  | Glrvao area. |  |  |  |  | **O ∙Zj** | Shawangunk | £ |  |  | 3 |
| *vesiculosus.* |  |  |  |  |  |  | g a | grit. J |  | j |  |  | υ | s 1 |
| *Diplograptus aιuminatus.* |  |  |  |  |  |  | 0 |  |  |  |  |  |  | 1 6 |

*Receptaculites* and *Ischadites* occur in the Silurian. Foraminifera and radiolaria also left their remains in the rocks. The most highly organized animals of the Silurian period were the fishes which had already made their appearance in the Ordovician rocks of Colorado and Russia. The Silurian fish include selachians *(Onchus, Thyestis),* and the occurrence of remains of the obscure backboned ostra- coderms (placoderms) is particularly worthy of notice *(Pteraspis, Cephalaspis, Tremataspis, Cyathaspis, Thelodus, Lanarkia, Euker- aspis).* Scorpions *(Palaesphonus)* have been found in Lanark, Gothland and New York. Plant remains are very fully repre­sented; land plants have been recorded from the Harz and Keller­wald (H. Potonie, 1901), and large silicified stems—up to 2 ft. in diameter—perhaps representing a gigantic seaweed *(Nematophycus),* have been found in Wales and in Canada. *Pachytheca* is a small spherical body often associated with *Nematophycus. Girvanella* is another obscure algal plant.

As a natural result of the open character of the great Silurian periarctic sea referred to above, there are many points of resemblance between the fauna of the several regions of the N. hemisphere\*, this has been specially noticed in the community not only of genera but of species between Britain, Sweden and the interior of N. America (Iowa, Wisconsin, Illinois). *Goniaphyllum pyramidale* is common to Iowa and Gothland; *Atrypa reticularis, Orthoceras annulatum* and not a few others are common to Europe and N. America. An extremely interesting circumstance is the admixture of a periarctic and Bohemian fauna in the Australasian region.

In a general sense the Silurian period was one of comparative quiescence as regards crustal disturbances, and a relative sinking of the land was followed by a relative elevation affecting wide areas in the N. hemisphere. Local oscillations, such as those taking part in the formation of the Salina beds, &c., were naturally taking place, but the folding of the Scandinavian mountains and in the N. highlands of Scotland continued throughout the period accompanied by a great amount of thrusting. Volcanic activity was quite subordinate in Silurian times; flows of diabase occurred at the commencement of the period in Bohemia, and evidence of minor basaltic flows and tuffs is found at Tortworth in Gloucestershire and at a few localities in N. America.

For further information, see articles on the Cambrian, Ordovician, Llandovery, Wenlock, Ludlow Systems and Groups. (J. A. H.)

**SILVA, ANTONIO JOSÉ DA** (1705-1730), Portuguese drama­tist, known as “ the Jew,” was born at Rio de Janeiro, but came to Portugal at the age of eight. His parents, João Mendes da Silva and Lourença Coutinho, were descended from Portuguese Jews who had emigrated to Brazil to escape the Inquisition, but in 1702 that tribunal began to persecute the *Marranos* in Rio, and in October 1712 Lourença Coutinho fell a victim. Her husband and children accompanied her to Portugal, where she figured among the “ reconciled ” in the *auto-da-fê* of the 9th of July 1713, after undergoing the torment only. Her husband, having then acquired a fixed domicile in Lisbon, settled down to advocacy with success, and he was able to send Antonio to the university of Coimbra, where he matriculated in the faculty of law. In 1726 Antonio was suddenly imprisoned along with his mother on the 8th of August; on the 16th he suffered the first interrogation, and on the 23rd of September he was put to the torment, with the result that three weeks later he could not sign his name. He confessed to having followed the practices of the Mosaic law, and this saved his life. He went through the great *auto-da-fê* held on the 23rd of October in the presence of King John V. and his court, abjured his errors, and was set at liberty. His mother was only released from prison in October 1729, after she had undergone torture and figured as a penitent in another *auto-da-fê.* Meanwhile Antonio had gone back to Coimbra, and finishing his course in 1728-1729 he returned to Lisbon and became associated with his father as an advocate'. He found an ignorant and corrupt society ruled by an immoral yet fanatical monarch, who wasted millions on unprofitable buildings though the country was almost without roads and the people had become the most backward in Europe. As his plays show, the spectacle struck Antonio’s observation, but he had to criticize with caution. He produced his first play or opera in 1733, and the next year he married a cousin, D. Leonor Maria de Carvalho, whose parents had been burnt by the Inquisition, while she herself had gone through an *auto-da-fê* in Spain and been exiled on account of her religion. A daughter was born to them in 1734, but the years of their happiness and of Silva’s dramatic career were few, for on the 5th of October 1737 husband and wife were both imprisoned on the charge of “ judaizing.” A slave of theirs had denounced them to the Holy Office, and though the details of the accusation against them seem trivial and even contradictory, Antonio was condemned to death. On the 18th of October he was beheaded and his body burnt in an *auto-da-fê;*