On fossil reptiles from the governments of Perm and Vologda / by H.G. Seeley.

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FROM THE GOVERNMENTS

OF PERM AND VOLOGDA

by

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The fossil Reptiles of Permian age in Russia have become of international interest, because other Reptiles nearly allied to them have been found in South Africa and India, in Scotland and the United States. This interest has been greatly augmented by the discoveries made by Professor Amalitzky of Warsaw of new reptiles in the Government of Vologda and of associated shells and plants in many parts of the Russian Empire.

A fossil terrestrial reptile is good evidence of the existence of a land surface, which interrupted the continuity of marine deposits in the Geological age in which the animal lived. But when the same reptile type becomes associated with the plants like Glossopteris, which Amalitzky has found with the new fossils, there is evidence of a lake or lakes in which the plants and animals were preserved. The Glossopteris is common to New South Wales, the Karroa in Africa, the Gon-

dwana rocks of India, and these Permian rocks of Russia This wide distribution does not prove that the land was continuous; of that there is no evidence: still less does such distribution prove that the lacustrine and fluviatile deposits of Permian age were formed in a fresh water, which was continuous. The fossil Reptilian life of these several regions is distributed over a number of isolated areas, each with its own peculiar fauna. The genera may be grouped under the order Anomodontia, but they vary with geographical distribution, just as the mammalian genera change when followed from one geographical region to another, at the present time. There is at present no proof that there is a genus in common among the Reptilia of any two Permian land areas. In a later time there is similar geographical diversity in the wealden Reptiles, for between the Wealden Reptiles of Sussex and the Isle of Wight, few genera occur in common, while the genera, which differ, are many.

Beside the evidences of ancient areas of land, which are thus of interest to the theory and facts of stratigraphical Geology, there is a zoological or palaeontological interest in the reptiles, which range from the lower Permian and Permo-Carboniferous of France, Texas, Elgin in Scotland, Russia, India, up to the slight indications of Anomodonts in the Rhœtic beds of Linkfield near Lossie mouth on the Murray Firth. The Animals, named collectively Anomodontia, appear on the one side to approach closely to the Labyrinthodontia, and on the other side, the Monotremata. M. Amalitzky's discoveries show that this diversity was nearly as conspicuous in Russia as in South Africa or America.

It has already been shown that types like Denterosaurus and Rhopalodon have many features of the skull in common with the Dicynodonts, yet the dentition is theriodont at least in Denterosaurus, with the incisors, canines, and molars de-

veloped as in Theriodontia. But the palate is a simple concave arch, as in Plesiosaurus and Dicynodon, with the palato-nares fully exposed and not arched over by bone. There is no approximation of, or even development of palatal plates of the maxillary palatine or pterygoid bones. And for that reason the Denterosauria has been separated from the Theriodontion. M. Amalitzky, by means of the specimens exhibited during the meeting in the temporary museum, recognises the Pareiosauria as probably present in the Permian of Russia; and in that type the palate is covered, much as in Crocodiles and the great Ant-eater, though the palato-nares are not carried so far back.

These new specimens from Vologda comprise a portion of a jaw with indications of 10 or 12 enamelled serrated teeth. The jaw is about half the size of the jaw of Pareiosauria Bacui. The teeth are inflated and smooth over the external surface of the crown. The crown is relatively narrower and deeper than in the African species of that genus. There are five serrations on each side of the similar median denticle. The inner surface of the crown is slightly convex, without the radiating ridges of enamel seen in Pareiosaurus Bainii. The dorsal vertebra of the same animal shows the same strong Plesiosaur-like centrum seen in Pareiosaurus and Dicynodonts. There is a similar transverse expansion of the neural arch with short strong neural spine rounded above and ridged back and front. The zygapophysial facets are large, and the articular facets for the ribs have a corresponding transverse extension beyond the facets. The articular facets for the ribs appear to be divided, as is sometimes seen in Pareiosaurus. When the specimens are farther divested from the matrix it may be possible to speak with more confidence on this affinity. But the small size of what appears to be a humerus may indicate that the fossil indicates a new genus peculiar to Russia.

These Russian fossils show little affinity with the monotremata: their affinity is stronger with the Labyrinthodontia. I have no doubt that the Anomodontia, like the Dinosauria, includes dissimilar types of structure. The Denterosaurian and Dicynodont makes a transition to the Cetiosauria! This is shown in community of form of brain, teeth, pelvis and limb bones, so that it would be more natural to associate those types in one group, than to place the entirely monotreme Theriodonts in the same group with Denterosaurus. These new Russian Pareiosaurian fossils, intermediate in some respects between the two groups, are also strong in their affinity with Cetiosaurus.

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