8. On *Atherstonia madagascariensis*, a New Species of Palaeoniscoid Fish from Madagascar^{*)}

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In 1973 the Tokyo University of Agriculture sent the fourth research mission to Madagascar in order to investigate the mechanism and process of specific differentiation of Madagascan plants and animals. The writer collected several hundreds fragments of fishes and amphibians with many ammonites and posidonians from the Lower Triassic middle Sakamena group of Irarona village, about 25 km southwest of Ambilobe, Northwest Madagascar. The fossil fishes are tentatively identified with the following fifteen species.***) Among these species the writer describes *Atherstonia madagascariensis* in the following lines.

The genus *Atherstonia* had been described by A. S. Woodward from the Permo-Triassic Beaufort beds of South Africa, with *A. scutata* as the type species. Other known species are as follows: *A. minor* and *A. seeleyi* from the Beaufort beds of South Africa, *A. australis* from the Middle Triassic Hawkesbury series of New South Wales, Australia, *A. cairncrossi* from the Lower Triassic middle Beaufort beds of South Africa, *A. colcanapi* from the Upper Permian lower Sakamena group of Eliva, Southwest Madagascar, *A. razumovskyi* from the Upper Permian of European Russia, and ?*A. sp.* from the Lower Triassic upper Beaufort beds or Middle Triassic lower Stormberg beds of North Rhodesia. The distance between the two Madagascan localities is more than 1200 km and their stratigraphic horizons are also different.

Before going into the description of the new species the writer expresses his cordial thanks to Prof. Norio Kondo, the representative of the mission, and to all other members. Many thanks are given also to the officials of the Government of Malagasy Republic, to the gentlemen of the Kyokuyo Company at Ambilobe, and to Messrs. Inaoka

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^{**) Boreosomus gillioti, Pteronisculus cicatrosus, Bobasatrania mahavavica, Ecrinesomus dixonii, Australosomus merlei, Sakamenichthys germaini, Perleidus madagascariensis, Atherstonia madagascariensis, Errolichthys mirabilis, Saurichthys madagascariensis, Parasemionotus labordei, Watsonulus eugnathoides, Colacanthus madagascariensis, Piveteauia madagascariensis, and Whiteia woodwardi.}

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Atherstonia madagascariensis sp. nov. (Figs. 1–5)

Materials. IEBP-MP108(holotype), 201(paratype), 202(paratype).

Description. The specimen indicates the general form of the fish fairly well, but the head is already broken away except some parts of the opercular, subopercular, and supracleithrum. These three bones are ornamented with tubercles. The fins are imperfectly preserved except the caudal. The pectoral fins seem to be composed of twenty rays. The anterior five of them are unarticulated in the proximal half of their length, but all seem to be articulated distally and bifurcated. The remaining fifteen are also articulated and bifurcated. The pelvic fins are much larger than the pectorals and seem to be composed of more than thirty rays, gradually decreasing in length posteriorly, and all of them distinctly articulated and bifurcated. The dorsal fin arises behind the posterior extremity of the pelvics and seems to be composed of more than thirty-five articulating and bifurcating rays, of which the seventh or eighth is the longest and followed by gradually shortening rays posteriorly. The anterior

Atherstonia madagascariensis sp. nov.

Fig. 1. Right-side view of holotype (IEBP-MP108) $\times 0.32$, Fig. 2. Right-side view of paratype (IEBP-MP202) $\times 0.32$, Fig. 3. External view of flank-scales $\times 1.9$, Fig. 4. Right-side view of paratype (IEBP-MP201) $\times 0.32$, Fig. 5. Left-side view of paratype (IEBP-MP201) $\times 0.32$,

border is fringed with very small fulcra. The anal fin arises in the middle of the dorsal and seems to be composed of more than forty-five articulating and bifurcating rays. The caudal fin is deeply cleft, nearly equilobate, and composed of approximately sixty rays. In the dorsal lobe all of them are bifurcated for four-fifths of their length. In the ventral lobe anterior fourteen or fifteen are undivided and the rest are bifurcating for four-fifths of their length. The upper margin of the body axis, extending into the dorsal lobe, is bordered by sixteen unpaired fulcral scales and the lower margin of the ventral lobe by a series of minute fulcra.

The trunk is completely invested with thick rhomboidal scales which are externally ornamented with delicate ridges of enamel and defined posteriorly with fairly smooth edges. The ridges are oriented in an anterodorsal-posteroventral direction throughout the body, but the number of ridges is variable. The size and proportions of the scales vary with part, those in the middle of the flank being the largest and those at the base of the insertion of the fins the smallest. The scales of the middle flank is as deep as broad, but dorsally and also ventrally the scales become broader than deep, until the breadth often becomes thrice as large as the depth. Along the axis of the extremely attenuated body the scales are elongated diagonally. Owing to the imperfection of the fossil the ridge-scales cannot be observed along the entire extent of the dorsal margin except nine ridge-scales commencing immediately at the back of the head. The number of vertical scale rows between the posterior border of the supracleithrum and the beginning of the caudal inversion may be estimated to be between seventy and eighty.

Measurements	<i>madagas-</i> <i>cariensis colcanapi</i>	
Length between the posterior border of dorsal fin and the extremity of dorsal lobe of caudal fin	189 mm	68 mm
Length between the posterior border of pelvic fin and the extremity of dorsal lobe of caudal fin	336 mm	134 mm
Length between the anterior border of anal fin and the extremity of dorsal lobe of caudal fin	222 mm	89 mm
Height between the posterior border of dorsal fin and the anterior border of anal fin	93 mm	42 mm
Number of scales along lateral line	64 +	50

Remarks. Judging from the measurements, *A. madagascariensis* is larger than *A. colcanapi* and the scales along the lateral line of the former species are more numerous than those of the latter. The former was found in association with some trematosaurid and ben-

thosuchid amphibians and seems to belong to the Lower Triassic. On the other hand, the latter had been obtained with some tanga-saurid and weigeltisaurid reptilians and is considered to belong to the Upper Permian. The writer believed that *A. madagascariensis* must be distinguished from *A. colcanapi* on the basis of their sizes, numbers of scale rows, and stratigraphical horizons. Among three South African species, namely *A. scutata*, *A. minor*, and *A. seeleyi*, the latter two are too fragmental to be discriminated from the type species *A. scutata*. *A. madagascariensis* closely resembles *A. scutata*, but it seems to be distinguishable from the latter by the relatively large size and by its feebler ridge-scales. Another South African species, *A. cairncrossi*, is discriminated from *A. scutata* by the denticulated posterior margin of flank-scales. *A. madagascariensis* is clearly discriminated from *A. cairncrossi* by the posterior smooth edge of the flank-scales. An Australian species, *A. australis*, is discriminated from *A. scutata* by the denticulated posterior margin of the flank-scales. *A. madagascariensis* is also distinguishable from *A. australis* by this posterior smooth margin of flank-scales. An European species, *A. razumovskyi*, is one of the most ancient representatives and shows in some degree a transition to the Lower Triassic *A. scutata* and the Middle Triassic *A. australis*. *A. madagascariensis* may also be discriminated from *A. razumovskyi* by the larger size, more numerous scale rows, and upper stratigraphical horizon. A North Rhodesian specimen, ?*A. sp.* is too fragmental to be compared with *A. madagascariensis*.

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