

города вблизи башни «Длинный Герман» количество трещин субмеридионального простирания составляет около 20%, субширотного — около 19% и северо-восточного — около 18%. (Относительное количество трещин северо-западного простирания не устанавливалось, поскольку обнажение имеет то же направление.)

В обнажениях северного склона Вышгорода количество субмеридиональных трещин достигает почти 49% (см. рис. 1, обн. 2). Следовательно, для исследованных участков Вышгорода характерна относительно густая сеть трещин субмеридионального и субширотного простираний. Это обусловлено, очевидно, наличием зон тектонических нарушений. Такой вывод совпадает с литературными данными, согласно которым повышенное количество трещин отмеченных простираний наблюдается на тех территориях, где моноклинальное залегание слоев нарушено (Геология СССР, т. 1, 1971).

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### ARTHRODIRE *HOLONEMA* FROM THE MIDDLE DEVONIAN OF NOVAYA ZEMLYA

ELGA MARK-KURIK. ARTHRODIIR *HOLONEMA* NOVAJA ZEMLJA KESKDEVONIST

Эльга МАРК-КУРИК. АРТРОДИРА *HOLONEMA* ИЗ СРЕДНЕГО ДЕВОНА НОВОЙ ЗЕМЛИ

*Holonema* is a large placoderm fish with a characteristic ornamentation of ridges and tubercles. This arthrodire is distributed in the Middle and Late Devonian of several continents. Nine species (most of them poorly known) and a number of indeterminate remains of *Holonema* have been found in North America, Arctic region, Europe, Asia and Australia. The genus seems to be more common in the Middle Devonian. A new Middle Devonian species can be established that comes from the marine deposits of the southern part of Novaya Zemlya.

## Family Holonematidae Obruchev, 1932

Genus *Holonema* Newberry, 1889*Holonema arcticum* n. sp.

**Holotype.** An incomplete right posterior dorsolateral plate (PDL, Fig. 1), Palaeontological Institute, Academy of Sciences of the USSR.

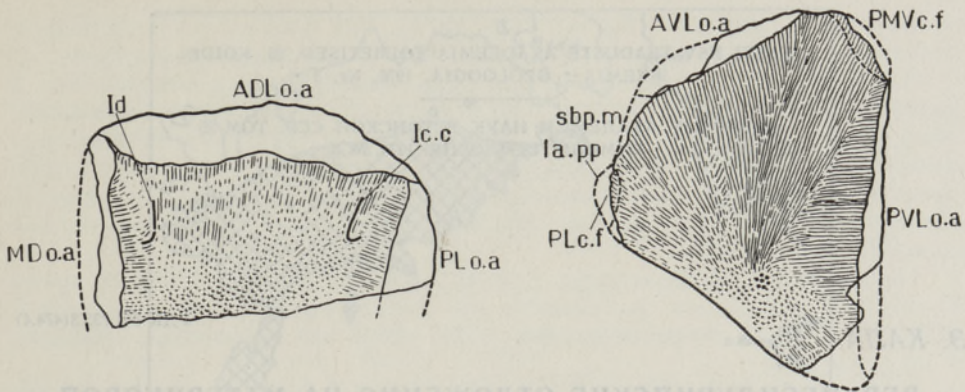
**Occurrence.** Middle Devonian, the base of the Givetian; Novaya Zemlya, Podgorny Peninsula, Rusanovo region.

**Diagnosis.** Large form. Plates of the trunk-shield massive. Anterior portion of the posterior dorsolateral plate almost rectangular. Lateral-line grooves (ld, lc.c) on that plate weakly developed and widely spaced. Posterior ventrolateral plate roughly trapezoid with a short posterior medioventral contact face (PMV c.f) and with a slight concavity in the posterior margin.

**Description and discussion.** Two remains are known: the posterior dorsolateral (holotype) and the posterior ventrolateral plates. They were collected by S. Cherkessova (Institute of Geology of the Arctic, NIIGA) in 1953.

The posterior dorsolateral plate (PDL, Fig. 1) lacks its posterior portion. The specimen is 17.6 cm wide, 12.7 cm long and up to 0.9 cm thick. When compared with the corresponding plate of *Holonema westolli* Miles, the most completely known species from the Frasnian of Australia (Miles, 1971), the anterior portion of the plate is rectangular, the overlap areas of median dorsal (MD o.a) and anterior dorsolateral (ADL o.a) plates forming almost a right angle. Thus, the contact line of the anterior and posterior dorsolateral plates might be roughly perpendicular to the longitudinal axis of these plates. In *H. westolli* (see Miles, 1971, Fig. 64) this contact line runs obliquely backward, the upper portion of the anterior dorsolateral plate taking up two-thirds of the lower one. So, in *H. arcticum* the anterior dorsolateral plate was evidently shorter than in *H. westolli* and also in *H. obrutshevi* Mark (the Eifelian of Estonia: see Mapk, 1953; Pl. I, Fig. 2; Fig. 4). Two lateral-line grooves are developed in the anterior portion of the posterior dorsolateral plate. These are the dorsal (ld) and posterior (lc.c.) branches of the main line. The grooves are low, narrow and widely spaced. They are situated not far from the anterodorsal and anteroventral angles of the plate. In *H. westolli* (see Miles, 1971; Figs 64, 71, 72) the dorsal branch is not developed, the posterior one much longer than in *H. arcticum* runs almost along the midline of the posterior portion, extending to the hind margin of the trunk-shield. The ornamentation consists of round or oval tubercles (6—8 per cm) with somewhat stellate bases; at the edges of the plate they are orientated in rows.

The right posterior ventrolateral plate (PVL, Fig. 2) is almost complete. The length (incomplete) is 19, the width 15 cm, the thickness up to 0.6 cm. When compared with that of *H. westolli* (see Miles, 1971; Figs 65, 77, 89, 92, 93) the plate is more rectangular, its anterior and posterior overlap areas (AVL o.a, PVL o.a) being longer and the posterior medioventral contact face (PMV c.f) much shorter. The posterior margin is convex in *H. westolli*, but in *H. arcticum* it has a concavity in its anterior third. The configuration of the posterior ventrolateral plate indicates that in *H. arcticum* the posterior portion of the ventral shield was more pronounced than in *H. westolli*. From the proportions of the posterior medioventral contact face (PMV c.f) and the overlap areas beside the face (AVL o.a, PVL o.a) it appears that the posterior medioventral plate might be much slenderer in its posterior portion than the corresponding plate in *H.*



*Holonema arcticum* n. sp. Fig. 1. Right posterior dorsolateral plate, the holotype,  $\times 1/4$ ; Fig. 2. Right posterior ventrolateral plate,  $\times 1/4$ . ADL o.a., AVL o.a., MD o.a., PL o.a., PVL o.a. — anterior dorsolateral, anterior ventrolateral, median dorsal, posterior lateral and posterior ventrolateral overlap areas; PL c.f., PMV c.f. — posterior lateral and posterior medioventral contact faces; la.pp. — postpectoral lamina, lc.c., Id — posterior and dorsal branches of main lateral line, sbp.m. — subpectoral margin; in Fig. 2 the radiation centre dotted.

*westolli*. The ornamentation of the plate is finer and more variable than that of the other specimen. Two-thirds of the plate are covered with radial ridges (10—11 per cm) comprising one row of tubercles. There is a net-like irregular pattern of anastomosing ridges developed in the remaining portion, and a group of larger tubercles at the radiation centre.

In case we do not consider the indeterminable *Holonema* remains re-deposited from the Devonian into the Upper Cretaceous or Tertiary in Arctic Canada (see Dineley, Rust, 1968), the only *Holonema* find reported so far from the Arctic region is that of the Late Devonian of Spitzbergen, the Fiskekløfta Formation, the Mimerdalen Series (*H. cf. radiatum*: see Heintz, 1935). In this paper the second occurrence of *Holonema* has been presented, that from the Middle Devonian, Givetian of Novaya Zemlya.

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