

ORGANIC AND INORGANIC HIEROGLYPHS FROM THE LATE PALEOZOIC OF SOUTHERN HUNGARY

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In the Late Paleozoic sequence explored by the borehole Turony-1 on the northern border of the Villány Mts in Southern Hungary (*Fig. 1*), a great deal of sedimentary external and deformation structures were found on the bedding planes of the fine-clastic sediments. The formers originate from mechanical effects of co-eval animals or represent prints of propagating organs of plants. The letters indicate penesynsedimentary features of the bedding surfaces produced from liquefaction of the tiny sandy layers within the beds.

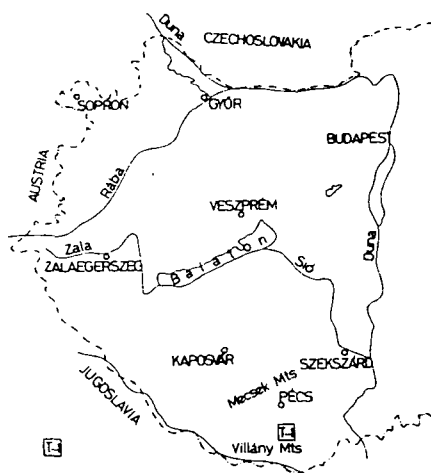


Fig. 1. Location of the borehole Turony-1.

The extension of these structures is limited, because they are visible only on drill samples. This is why both the study and the determination of them — with exception of two footprints — is only of approaching value. In spite of this their illustration can be of importance, because such structures were found in the Late Paleozoic of Hungary till now only in the mentioned place.

After crossing of the Late Neogene, Middle and Lower Trias, Late and Middle Permian, the drilling ended in Permo-Carboniferous beds (*Fig. 2*). The bedding surface and deformation structures were found in the lower section of the borehole,

in purplish, well-bedded, sericite-bearing, finegrained sandstone and siltstone beds between 1165—1450 m. The Permocarboneous age of this bedgroup was determined partly on the ground of the well-preserved footprints of a primitive *Amphibian*, partly with help of an ensemble of Lower Permian *Sporomorpha* coming from the coarser-grained sandstone beds that overly the formers after a smaller break of tectonical origine.

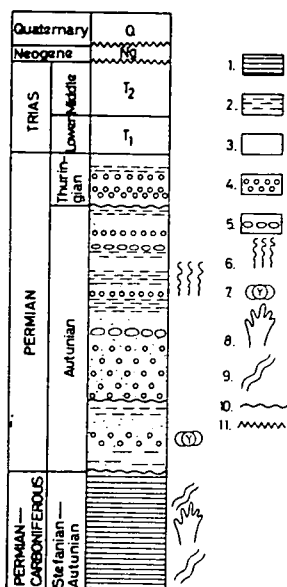


Fig. 2. Geological profile of the borehole Turony-1.

1. Alternation of fine grained slaty sandstone, siltstone and shaly mudstone. 2. Fine and small grained sandstone. 3. Middle grained sandstone. 4. Coarse grained sandstone. 5. Conglomerate. 6. Traces of creeping of worms. 7. Sporomorphs. 8. Footprints. 9. Inorganic hieroglyphs. 10. Tectonical contact. 11. Erosional unconformity.

The over-mentioned footprint determined by DR. H. HAUBOLD (University of Halle, DDR) as *Antichnium (Saurichnites) salamandroides* (GEINITZ) is stratigraphically very important (Plate I, Fig. 1). After studies of DR. HAUBOLD it can be found namely alone in the Stephanian and Autunian stages of the Late Paleozoic of Thuringia; but in the Saxonian stage it is already absent. So its presence or absence is significant for the separating of the Autunian and Saxonian.

An other footprint could be determined as *Platytherium psammobates* BARKAS known from the Carboniferous of the British Isles (Plate II, Fig. 6).

The found structures can be divided into the following groups:

EXTERNAL STRUCTURES:

I Bioglyphs

1. Footprints of primitive Amphibians
2. Prints of propagation organs of plants Sporangia of a primitive Pteridophyte Macrospores
3. Uncertain organic traces

II Mechanoglyphs

1. Current scours
Flute moulds (?) deformed by loading
Small longitudinal furrows
Dendritic-ridge moulds (?)
2. Tool marks
Broad groove mark
Prod moulds
Bounce moulds
Chevron mark
3. Ripple marks

DEFORMATION STRUCTURES:

I Sand injections

1. Sand volcanoes

All these refer to an intermittently desiccated, shallow fresh-water environment controlled occasionally by rather quick currents.

EXPLANATION OF PLATES

PLATE I

1. *Antichnium (Saurichnites) salamandroides* (Geinitz 1861) Haubold 1970. Borehole Turony-1. 1220 m. *On the left*: mould; *on the right*: print.
- 2—3. Footprints unknown primitive *Amphibians*. Borehole Turony-1.
2. *On the left*: mould; *on the right*: print. 1423 m. 3. *On the left*: print; *on the right*: mould. 1399 m.

PLATE II

- 1—5. Footprints of unknown primitive *Amphibians*. Borehole Turony-1.
1. *On the left*: mould; *on the right*: print, both associated with prod marks (1331 m). 2—3. Moulds of footprints (1301 m). 4. *On the left*: print; *on the right*: mould (1358 m). 5. Very small footprints. (1301 m).
6. *Platytherium psammobates* Barkas (1301 m).

PLATE III

- 1—2. Sporangia of a primitive *Pteridophyta*. Borehole Turony-1. 1450 m and 1288 m, respectively.
3. Macrospores. Borehole Turony-1. 1444 m.
- 4—5. Organic traces of uncertain origine. Borehole Turony-1. 1375 m and 1354 m, respectively.

PLATE IV

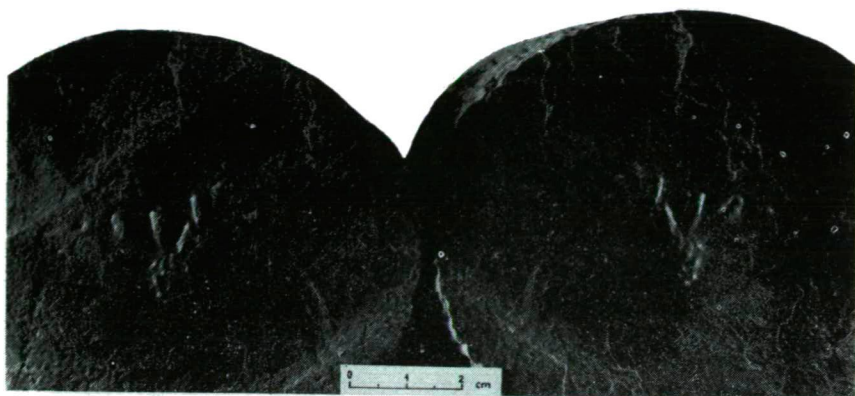
1. Organic rest of uncertain origine. Borehole Turony-1. 1352 m.
On the left: mould; *on the right*: print.
2. Ripple marks associated with prod moulds (?). Borehole Turony-1. 1347 m.
3. Flute moulds deformed by loading. Borehole Turony-1. 1370 m.
4. Small longitudinal furrows. Borehole Turony-1. 1285 m.
5. Broad groove mark. Borehole Turony-1. 1430 m.

PLATE V

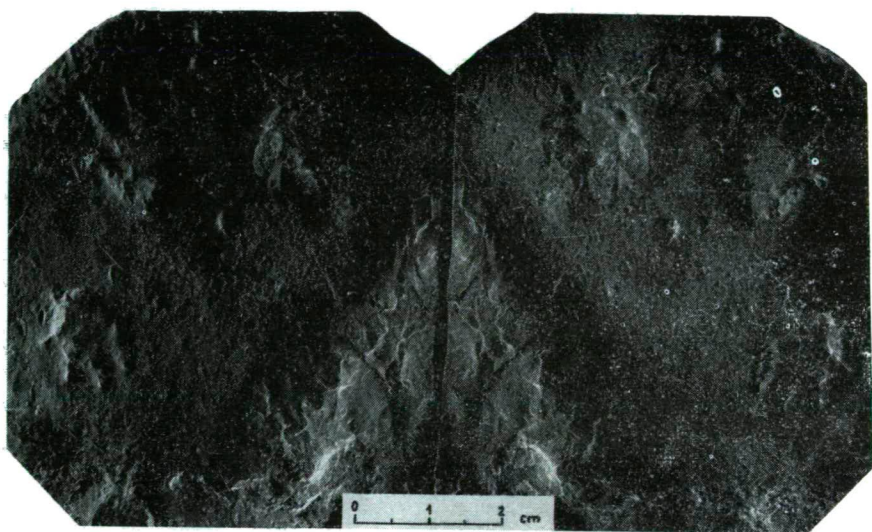
1. Dendritic-ridge molds (?). Borehole Turony-1. 1349 m.
2. Prod moulds. Borehole Turony-1. 1438 m.
3. Prod moulds associated with small bounce marks. Borehole Turony-1. 1332 m.

PLATE VI

- 1—2. Chevron mark. Borehole Turony-1. 1300 m.
On the left: print; *on the right*: mould.
3. Small prod marks. Borehole Turony-1. 1313 m.
4. Chevron mark. Borehole Turony-1. 1349 m.
5. Sand volcanoes. Borehole Turony-1. 1416 m.



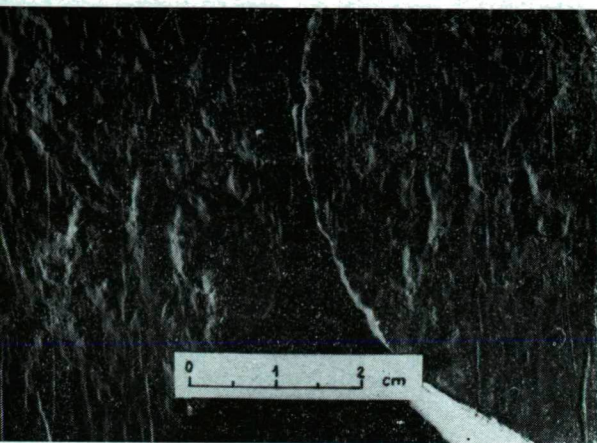
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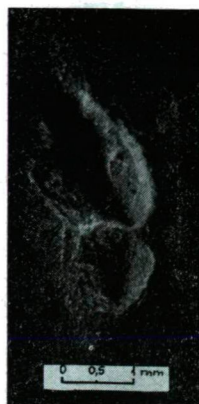
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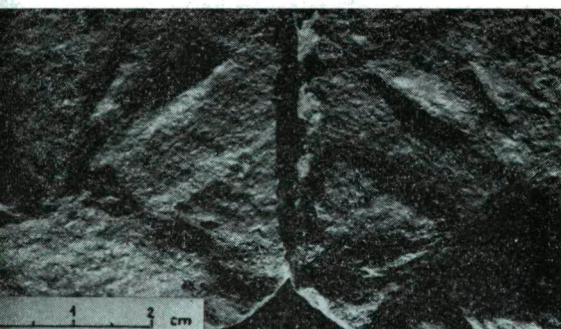
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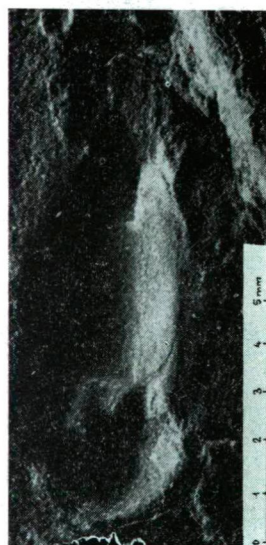
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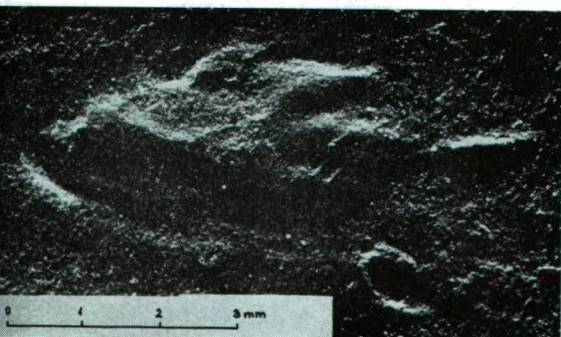
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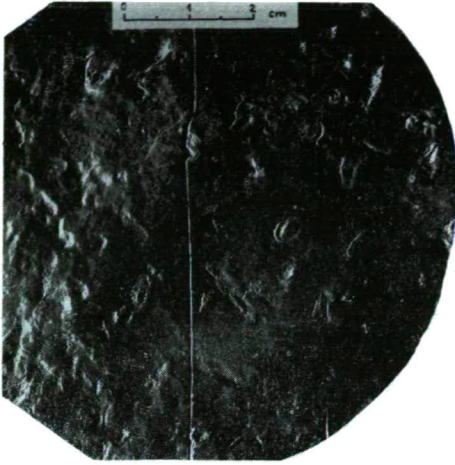
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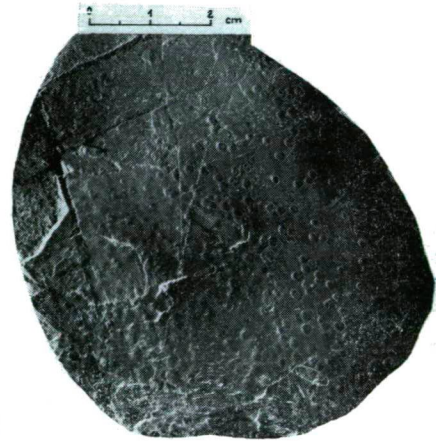
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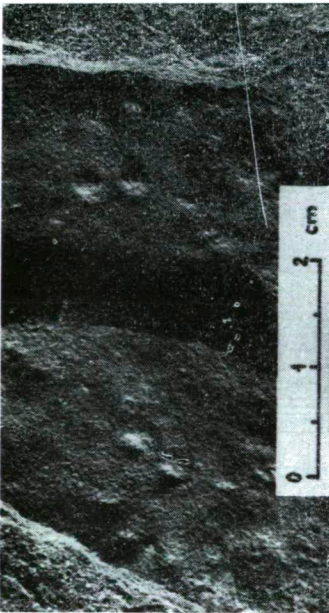
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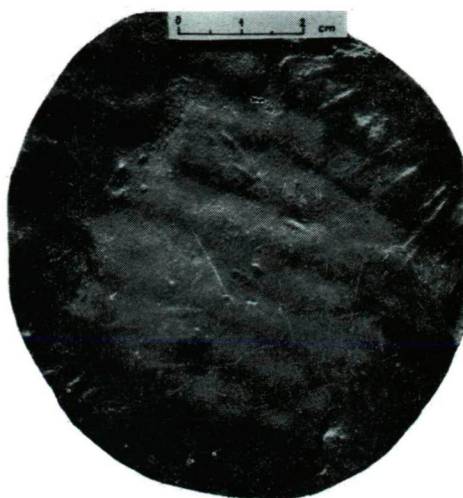
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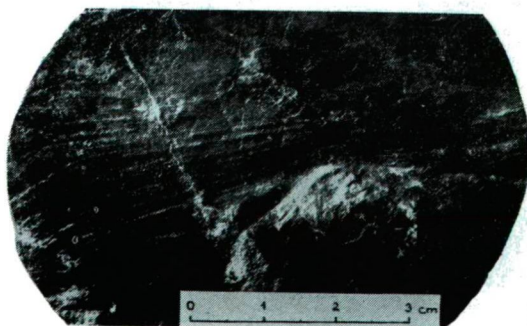
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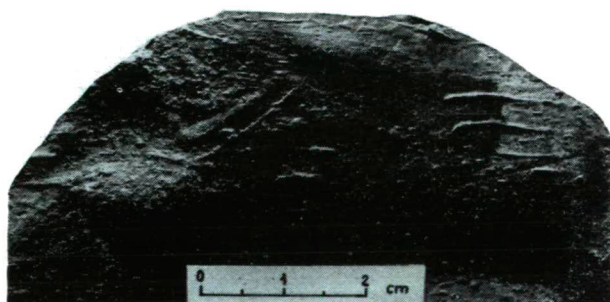
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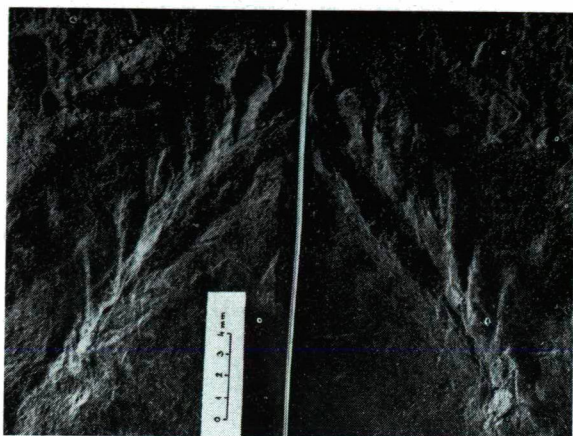


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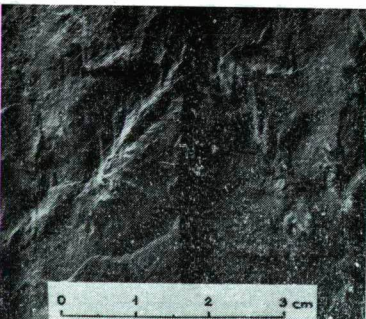
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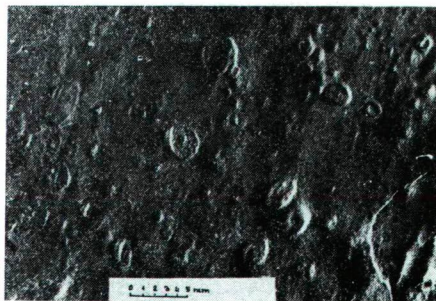
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