

SUBDIVISION OF THE UPPER PERMIAN SEQUENCE OF THE BÜKK MOUNTAINS IN NORTHERN HUNGARY

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INTRODUCTION

Superficial occurrences of the marine Upper Permian in Hungary can be found only in the Bükk Mountains (*Fig. 1*). Development and fossil content of them is stated by the fundamental publications of Z. SCHRÉTER and K. BALOGH. After these the sequence in question evolves from its anhydrite- and gypsum-bearing, Gröden-type-footwall gradually and is overlaid conformably by light-coloured Lower Triassic limestones. The present preliminary report relying on the basis of more detailed re-investigations enumerates the modifications of the former, hypothetically assumed stratigraphic column based principally on the distribution of the fossil assemblages.

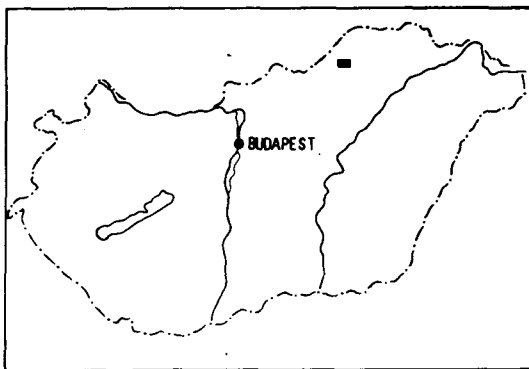


Fig. 1. Location of the superficial occurrences of the Upper Permian in Hungary.

METHODS

The undermentioned results are won from the comparative research of the outcrops in the western proximity of the railway station Nagyvisnyó, and in the railway-cuts situated towards the ENE from here, further along the road of forestry on the eastern side of the Sebesviz-valley (roughly 10 km distance off Nagyvisnyó towards the ESE). They are based on a bed-to-bed-sampling (on the average 1 sample/meter). Petrographic, paleontologic and tectonic observations on many other outcrops aimed at the generalization of the results.

From the 91 samples collected between the foot and the hanging, a lot of surficial slides, thin sections, etched preparations, replicas, and calcite: dolomite determinations were carried out.

RESULTS

1. After summing up the data concerning the thickness of the different detail-profiles, the total thickness of the Upper Permian of the Bükk, estimated formerly to 200—250 m, must be modified to 150 m. In spite of a little uncertainty caused by the covering with scree in some parts of the detail-profiles, this value may be raised with not more than 10—20 m.

2. In opposition to the former 6-member-subdivision of the sequence [BALOGH, K. 1964. p. 601], but observing its original delimitations towards the 'oot- and the hanging wall, respectively, the distinction of the following four, well characterized members is proposed:

Lower Trias

4. member: Banded Limestone	10 m
3. member: Dark limestones with intercalations of marl	55 m
2. member: Dark limestones with <i>Waagenophyllum</i>	5—7 m
1. member: Grey dolomites with intercalations of dark limestone	70 m

Beds of Gröden-type

The 1. and 4. member of this subdivision can be well correlated with the 1. and the 6. member of the former one, respectively. Considering the succession and the number of the intermediary members, however, the new subdivision differs considerably from the former one as follows:

a) Instead of two ones, only one horizon of *Waagenophyllum* could be established in the middle part of the sequence.

b) On the basis of the occurrence of *Waagenophyllum*, *Inozoa* (*Peronidella baloghi* FLÜGEL, H. W. 1973) and *Nautiloidea*, the formerly assumed high position of the beds of the railwaycut No. 5 rich in fossils (*Lyttonia*, *Tschernyschewia*, clams, gastropods, etc.) must have been ceased. Namely these beds have to be the equivalent of those of the "Mihalovits"-quarry. From that parallelization, however, a decrease of 50 m in the total thickness of the Upper Permian sequence results.

c) The dependence of the spreading of the calcareous *Algae* (*Gymnocodium*, *Mizzia*, *Permocalculus*), small foraminifers, brachiopods, clams and gastropods on the facies could be stated. These forms are namely to search only for restricted distances. Therefore they are inapplicable for a closer identification of the beds of different localities.

3. By studying the microfacies the following establishments could be verified:

a) the 1. member consists of dolomicrite, dolosparite, bioclastite of wackestone-type, bioclastic micrite, sparry bioclastite and sparry mikbioclastite; all these build up altogether 13 bed groups, in the uppermost one with the first *Inozoans*; certain samples contain crystals of gypsum, too;

b) the 2. member includes limestones bearing *Waagenophyllum*, *Inozoa* and in some places lenses of chert, too; usually, however, they are silicified only spottily, and consist of sparry, resp. coral-bearing bioclastite of packestone-type;

c) the 3. member of variable composition build up of limestones and intercalated marls may be divided into 6 bedgroups consisting bioclastic micrite, micro-

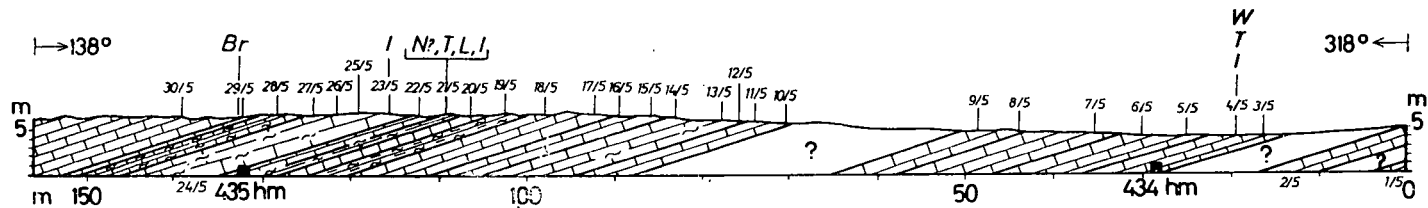


Fig. 2. Geologic section along the railway-cut No. 5 ENE of Nagyvisnyó. — Legends at Fig. 3.

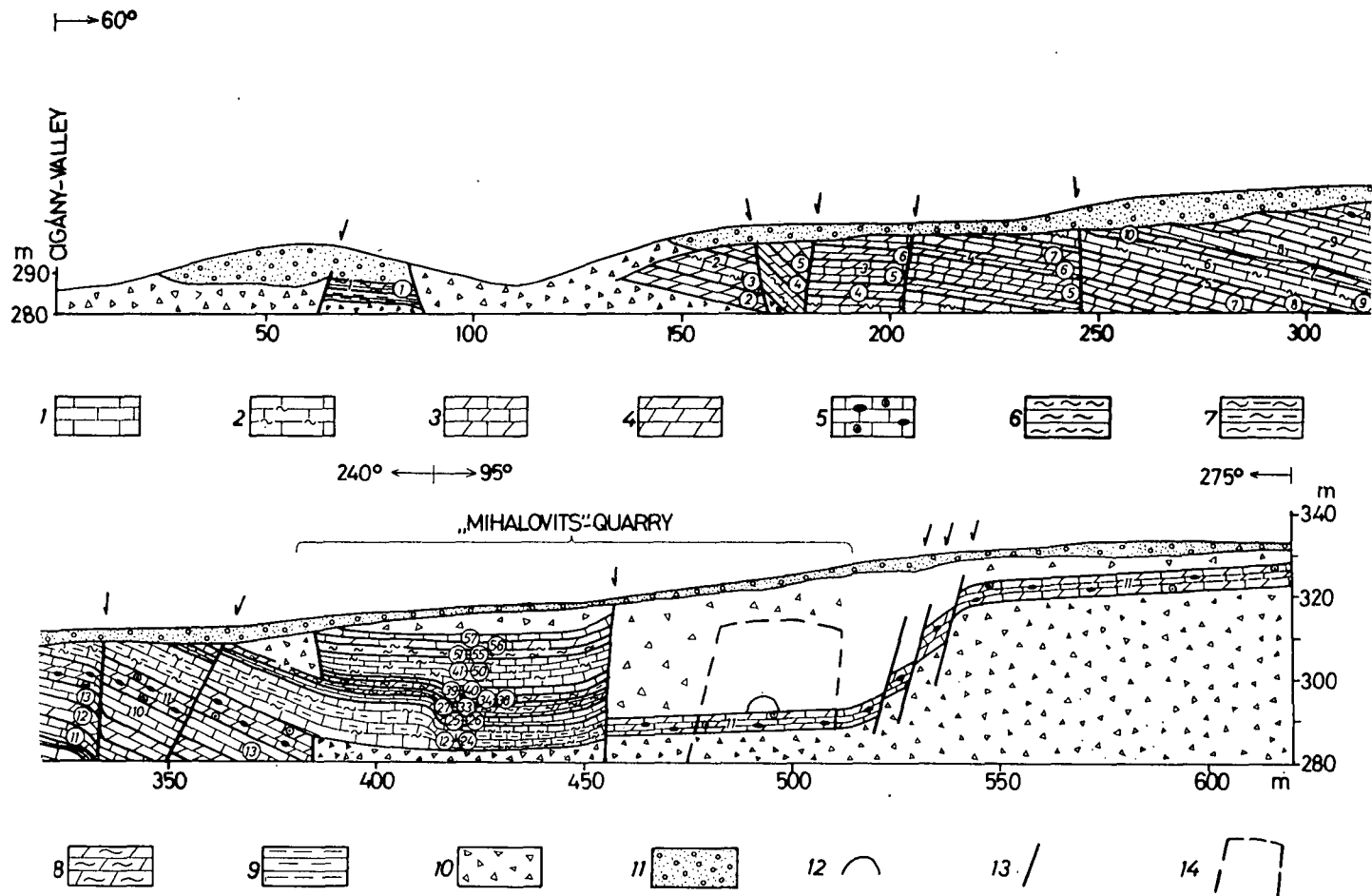


Fig. 3. Geologic section between the Cigány-valley and the railway station Nagyvisnyó. 1. Limestone. 2. Limestone interbedded by calcareous marl. 3. Dolomitic limestone. 4. Dolomite. 5. Limestone with *Waagenophyllum* and lenses of chert. 6. Dolomitic calcareous marl. 7. Clayey marl. 8. Dolomitic marl. 9. Shale. 10. Scree. 11. Miocene sandstone and conglomerate. 12. One-time depot of explosive. 13. Fault. 14. Smaller quarry. I: Inozoans. L: *Lyttonia*. T: Trilobite. W: *Waagenophyllum*. N: Nautiloids. Br: Brachiopods. hm: Railway-point. ?: Covered part of the section. Numbers in circle: Serial numbers of the bed groups. Simple numbers: Places of sampling.

sparry micrite, bioclastic sparite, micritic bioclastite, micritic pelletite, sparry biomicrite, sparry mikbioclastite, calcareous marl, dolomite-bearing and dolomitized calcareous marl, dolomitized and dolomite-bearing marl, further clayey marl;

d) the 4. member build up of banded limestones consists of micrite with microsparry lamelles and contains sometimes dolosparry ooids, too;

e) the Upper Permian of the Bükk originated in < 40 m depth in a less ventilated part of the sublittoral region;

f) the agitation of water became more vivacious only during the building-up of the banded, poor-in-fossil, but oöide-bearing limestones of the uppermost part of the sequence in question; the latter continue without break in the more lighter limestones of the Lower Triassic consisting of similarly laminated micritic oosparite, resp. oöide-bearing sparite. The boundary between the Upper Permian and Lower Triassic may be drawn only by the help of the disappearance both of the calcareous algae, crinoid fragments, and the dark colours, because the first beds of the Lower Triassic transgression are entirely free from fossils.

5. Up to the present day the Upper Permian of the Bükk furnished only rare and specifically undeterminable rests from the group of the *Fusulinids* (*Staffella* sp., *Reichelina* sp., *Codonofusiella* sp.).

The succession of the macrofossils collected from bedrock:

Railway-cut No. 5 (Fig. 2):

2. member (in the vicinity of the hectometer No. 434): *Inozoa*, *Waagenophyllum* sp., *Pseudophyllipsia hungarica* SCHRÉTER.

3. member, *Lyttonia*-bed (at the hectometer No. 435): *Peronidella baloghi* FLÜGEL, H. W., *Lyttonia nobilis* (WAAGEN), *Pseudophyllipsia hungarica* SCHRÉTER, *Pseudorthoceras cyclophorum* (WAAGEN) (?).

3. member, cca. 5 m above the *Lyttonia*-bed: a rich association of brachiopods with *Tschernyschewia* [v. BALOGH, K. 1964. pp. 596—597; SCHRÉTER, Z. 1963].

“Mihalovits”-quarry (Fig. 3):

1. member, 13. bed group, 10. sample: *Inozoa*.

2. member, 11. sample: *Waagenophyllum* (*Waagenophyllum*) *kueichowense* HUANG (OR *W. (W.) huangi* Douglas).

3. member, 17—19. sample: *Pseudorthoceras cyclophorum* (WAAGEN).

Eastwards from the Sebesvíz-valley, along the lower road of forestry (Fig. 4):

2. member: *Waagenophyllum kueichowense* Huang (or. *W. (W.) huangi* Douglas).

3. member (cca 42 m distance from the former one, in a place plotted in the profile on basis of the *Inozoa*-bearing scree): *Inozoa*.

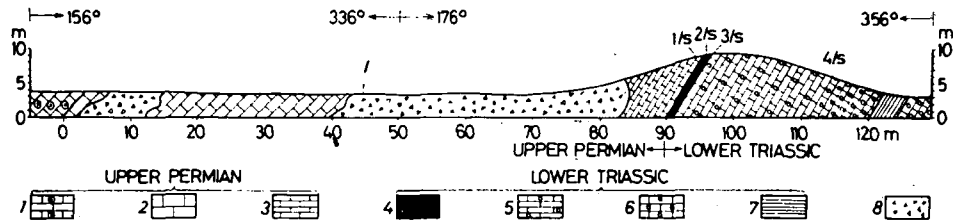


Fig. 4. Geological section along the lower road of forestry in the Sebesvíz-valley.

1. Limestone with *Waagenophyllum*. 2. Limestone. 3. Banded limestone. 4. Shaly marl. 5. Limestone containing a few oöides. 6. Oöidic limestone. 7. Laminated limestone and shale. 8. Scree. 1/S, 2/S: Places of sampling.

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