

LETTRES A LA REDACTION

GEOLOGIE

ON THE »TITHONIAN« IN REEF FACIES

In the year 1865 Oppel set up the name Tithonian for those Upper Jurassic strata in the southern Europe, which were representing a certain equivalent of north European Portlandian, or more exactly for the strata, which were situated above Kimmeridgian and beneath Neocomian. Numerous known localities of cephalopod fauna in Portugal, North Africa, south France, Switzerland, various parts of Alps and in the western Carpathian Mountains (finding places Rogoznik and Štramberk) were ranged in the Tithonian. In the majority of mentioned finding places Oppel made is stratigraphical conclusions on a basis of the cephalopods and on the brachiopod *Terebratula dyphia* (= *Pygope dyphia*).

We are mainly interested in the finding place at Štramberk, where also hydrozoans were later discovered. Oppel ascribed the Štramberk beds to the Tithonian on a basis of some cephalopods, anyhow, he himself already emphasized that the Štramberk fauna had a different character than the other Tithonian fauna in southern Europe.

In Štramberk beds Steinmann (1878) discovered two new hydrozoan genera *Ellipsactinia* and *Sphaeractinia*. He placed them in Tithonian considering the Oppel's statements. This characteristic Štramberk hydrozoan genera were later discovered in various places of Mediterranean area: in Italy (Canavari, 1893), in Croatia and Bela krajina (Herak, 1947, Poljak, 1944, Nikler, 1965), in Serbia (Grubić, 1958), in Montenegro (Radoičić, 1964), at Mačkovec in Slovenia (Germovšek, 1954), and at Ernstbrunn in Austria (Bachmayer and Flügel, 1961). At Mačkovec, Ernstbrunn and Štramberk there was found out besides Sphaeractinidae also other reach actinostromaridian fauna.

Canavari and all the Croatian investigators, as well as Germovšek and Flügel, were ranging Sphaeractinidae to the Tithonian. Grubić and some other geologists were ascribing them also to the Lower Cretaceous. In the whole sphaeractinids became leading fossils for Tithonian. Nearly all the mentioned authors came to the stratigraphical conclusion with the help of sphaeractinid fauna. In no locality, neither in Štramberk, the age was proved. Strata with Sphaeractinidae have in majority an indistinct position with regard to the beds above and below.

The last investigations in Slovenia showed that Sphaeractinidae and other actinostromaridian hydrozoans occurred already in the Lower Malmian beds. On Trnovski gozd and near Dob in Dolenjska S. Buser discovered a concordant succession of all the Upper Jurassic beds. Thus all the hydrozoan limestones appear between two definite horizons. They are lying on the Lower Oxfordian limestones with cherts and beneath the Upper Malmian strata with alga *Clypeina jurassica*. We can surely range them to the Upper Oxfordian and Lower Kimmeridgian age.

During the palaeontological examinations of Slovenian hydrozoan material I discovered that besides Sphaeractinidae exactly the same fauna of actinostromaridian type appeared on Trnovski gozd and near Dob, as it had been determined by Germovšek in Mačkovec and as it had been stated by Flügel in Ernstbrunn and afterwards in Štramberk.

On the basis of exactly the same hydrozoane association and even of the same species we may reliably make a final decision that all these fauna was prospering simultaneously. I am convinced that the localities at Ernstbrunn and at Štramberk are of the same age as the Slovianones it means, that they belong to the Upper Oxfordian and to the

Lower Kimmeridgian age. Of the same age are probably also the strata with Sphaeractinidae in Italy, in Serbia and in Croatia. But as long as we do not know all the hydrozoan associations, except the group of Sphaeractinidae, this statement for all localities can not be proved. Anyhow in the favour of my presumption is the fact, that Sphaeractinidae were also discovered in Montenegro in the Lower Malmian beds, beneath the strata with *Clypeina jurassica* (Radoičić, 1964). The fauna of Sphaeractinidae and other actinostromaridian hydrozoans lost its meaning as leading fossil of Tithonian.

The consequence is, that the Tithonian of various facies means different age. The Tithonian finding places of cephalopod fauna are of the Upper Kimmeridgian and Portlandian age. But the previous »Tithonian« hydrozoan reef fauna in Štramberk, Ernstbrunn, in Slovenia and in Montenegro is ascribed to the Upper Oxfordian and to the Lower Kimmeridgian age.

The Upper Malm in the Mediterranean reef facies, representing an equivalent of Tithonian in the cephalopod development, contains the leading calcareous alga *Clypeina jurassica*. In the Middle Europe this alga is ascribed to the Upper Kimmeridgian and Portlandian, in some places even to Purbeckian. I suppose we have not the right to use for above mentioned strata the name Tithonian. Therefore I mean that the name Tithonian is ambiguous and for the reef development better not be used.

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