found out. The first is homogeneous high resistive ($\rho_{LL}\approx$1000 Ohmm), low radioactive ($I_\gamma\leq$3 $\gamma$) and compact ($_\Delta\check{N}\approx$150 $\mu$s/m) limestone. They are referred to such formations of reef core that have not experienced karstifying.

The second type is the karstified limestone. On the well-log charts they differ by the heightened curve differentiation of all kinds (except of $_\Delta\check{N}$ and $I_\gamma$) that is conditioned by a differential in formation composition. Values are observed of low, not exceeding 200 $\mu$s/m, interval-time ($_\Delta\check{N}$) and of high intensity of a sec gamma-ray ($I_{\eta\gamma}$). The curve of a microlateral logging (MLL) is strongly differentiated: electric resistance is varied from 5 to 30 Ohmm in a near (from a borehole wall) zone of the bed. The curve of a lateral logging (LL) demonstrates resistance from 5 up to 60 Ohmm in a distant zone of the bed. As the natural radioactivity of the formation remains almost constant ($\approx 2\gamma$), that is generally inherent to reefogenic limestone, the variations of other parameters characterize the composition of these limestone. Declined values of an electric resistance and a sec gamma-ray (i.e. Neutron Gamma Logging or NGL) point the best collectors – cavernous limestone; in the intervals of their occurrence the anomalies of SP – spontaneous polarization (relative declining) and interval time (increasing) are observed.

The third type of limestone that happens in the sequence of the Oparian suite is determined on well-logging complex as fragmental one. Limestone has a composition from pelitic to sandy (psammitic) and spacefill the karst cavitations. Its formation is connected with exposing of a reef core and its subsequent erosion. Even bigger differentiation of MLL, LL, and NGL curves is featured to such limestone.

# The conditions of the forming the Upper Jurassic deposits in Ukrainian Precarpatian

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Upper Jurassic deposits in Ukrainian Precarpatian were formed on the periphery of Tethys North borderland. Biogerm building processes characterized their sedimentation from the Oxfordian until the forereef times. The development of reef constructions was bound with tectonic dislocations and their morphology conditioned by the tectonic activity on territory in considerable degree. During the Upper Jurassic time the evolution of nature and alteration of the location of the organogenous constructions, increase of thickness, narrowing of biogenic solids line and their displacement in time to the South–West in inner basin's district took place. The general paleogeographic environments in the Tethys basin were controlled by the transgression in Lower Oxfordian and the regression in Kimmerigian and Tithonian.

In Precarpation region Lower Oxfordian transgression reflected on the sedimentation of marine deposits – arenaceous limestones, sandstones, aleurolites. After that in the Middle Oxfordian the formation of biogerms in region began in Gorodok fault zone. Oxfordian biogermic building reflected on forming the line of separate spongea biostromes (approximately 100 m thicness) in shallow water marine regime. North–East of that line mainly colcarenite and oolitic transreef shoaly limestones (Rudky suite) were formed and replaced by near-shore lacustrine-marshy argillo-terrigenous deposits (Sokal suite) in the autlying districts. Toward the open basin biogermic limestones were replaced by interbedding clayey organic-detrital limestones and argillites, aleurolites that were formed in forereef zone of marine shelf. In the top of the all Oxfordian deposits the horisont of the clayey-terrigenous mainly variegated rocks was deposited in outward basin's zone as a result of the stopping the entrance of marine water and setting in hot aride climate in Upper Oxfordian time.

In Kimmerigian the shallow water marine regime was settled at the background of slowly submersion of the sea bottom. The spongea biogermic hills (~ 400 m thicness) were formed in Sudova-Vyshnja fault zone (Morantsy suite, I type). Beyond them toward the periphery of the basin shoaly dolomites and limestones were precipitated and replaced by succession of dolomites, anhydrites and gypsums – the deposits of lagoons, isolated on shoaliness as a result of arid climate (Rava-Russky suite). The forereef strata of interbedding organogenic-detrital and breccia limestones and argillites (Morantsy suite, II type) were settled in the inner zone in front of the biogerme line. Periodical tectonic destructions with downwarping the sea bottom took place. As a result of that Kimmerigian deposits include the limestone-clay breccia in sections in the peripheral parts of the basin.

The regression and intensive downwarping the sea bottom took place in Tithonian and Lower Berriassian, and the sedimentation area of Jurassic carbonates was diminished.

This rock masses (~ 800 m) of algae-coral barrier reef were formed in zone of Krakovetsky fault (Oparsky suite). Shallow oolitic and organic-calcarenite limestones were precipitated and single biogerms were formed in transreef zone (Nizhnevsky suite).

The forereef interbedding limestones and argillites were deposited in front of the barrier reef (Karolinskaja suite) in Tithonian-Lower Berriassian.

Foreshore shallow formations of this age are not opened by wells.

Building up the reefogenic structures was stopped at the beginning of Lower Cretaceous by intensive transgressive processes; and Upper Jurassic deposits partially were washed out and reprecipitated over the layers of argillites, somewhere with sandstones, in Upper Berriassian and Valanginian. Neocomian shoaly carbonates there consist of redeposited rounded fragments of Tithonian-Berriassian limestones (Stavchansky suite).

# Lower Badenian sediments and fossils from some boreholes in the Carpathian Foredeep southwards of Brno (Czech Republic) - paleoecological and paleogeographic implications

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In the past, many boreholes were drilled in the Carpathian Foredeep soutwards of Brno (Czech Republic). Authors had the possibility to study samples from three of them, namely HJ-1 Chrlice, HJ-2 Otmarov and HJ-103 Opatovice, their importance consisting in their position on the slopes of the Bohemian Massif in the continuation of the Nesvačilka trough. In the profiles of the studied boreholes sediments of various ages (Lower Badenian, Karpatian, ?Lower Miocene, ?Oligocene) belonging to the Tertiary filling of the Carpathian Foredeep were found. For the time being, only Lower Badenian sediments, representing the majority of samples, were studied in detail because of their uncommon sedimentary development.

The investigation of the Lower Badenian sediments from the HJ-1, HJ-2 and HJ-103 boreholes was made with the maximum possible complexity, therefore it included the sedimentological, paleontological (molluscs, fossil pollen and spores) and isotopic analyses (C and O of the carbonate molluscan shells). The results were used for paleoecological and paleogeographic interpretations.

The study confirmed that no significant lithological change can be observed between the sediments of Karpatian and Lower Badenian ages. This fact could be probably the evidence of an unbroken sedimentation. The uncommon absence of basal clastic sediments and of greater thicknesses of calcareous clays ("tegels") as well as of rhytmical interlaminatings of sandy and clayey layers are the typical characteristics of the Lower Badenian sediments in the studied boreholes. In the top direction the amount of coarse grained sediments increases gradually, in the upper parts of the HJ-2 and HJ-103 boreholes highly damaged shells of macrofossils were observed, moreover, in the upper parts of the HJ-2 borehole the amount of spores of Pteridophyta increases and the amount of marine microflora and foraminifers decreases. These facts document the global trend of a growing water dynamics and a shallowing of the sedimentary area.

The paleontological analyses confirm that the sedimentation took place in the marine environment with a normal salinity (corals, bryozoans, echinoids, molluscs - *Chlamys* cf. *malvinae*, *Anadara* sp., *Conus* sp. etc., red algae, accumulation of the pollen grains of the family Pinaceae, dinoflagellates with the branched projections and tapeta of foraminifers). The environmnet on the sea shore was probably rather wet (spores of Fungi, pollen of the genera *Alnus* and *Ulmus*) up to swampy (pollen of the families Taxodiaceae, Myricaceae and Cyrillaceae).

The clima was warm (presence of thermophile molluscs, for example *Conus* sp., *Anadara* sp., *Chlamys* cf. *malvinae*, pollen grains of the families Sapotaceae, Palmae, genera and species *Engelhardtia*, *Platycarya*, *Quercoidites henrici*, *Quercoidites microhenrici*, *Castaneoideaepolis pusillus*, *Castaneoideaepolis oviformis*, *Tricolporopollenites liblarensis* a *Tricolporopollenites marcodurensis*), but probably not extremely with regard to the relative representation of the thermophile and arctotertiary elements (*Carya*, *Pterocarya*, *Celtis*, *Ulmus*, *Alnus*, *Liquidambar*, Poaceae, *Sciadopitys*). The depth of the sedimentary area was probably in the range of littoral, the dynamics of the sedimentary environment being evidently generally relatively high or fluctuating. These conclusions are supported not only by the character of sediments, but also by the molluscan fauna - for example by the presence of the species *Terebra* sp., *Conus* sp., *Ostrea* sp. etc.). The isotopic analyses of C and O of the molluscan shells proved that the $\ddot{a}^{13}C$ values vary between -1.4 a 2.1‰ (PDB), the $\ddot{a}^{18}O$ values between -3.0 a 1.6 ‰ (PDB).

It appears that the Lower Badenian sedimentation in the studied area was primarily influenced by the existence of the Nesvačilka trough, e.g. that this structure manifested itself very conspicuously not only within the Lower Miocene, but also at the beginning of the Upper Miocene, namely in the Lower Badenian. Therefore, the local sedimentation in this part of the Carpathian Foredeep differed from the typical Lower Badenian developments with the presence of the basal clastic sediments and a considerable predominance of calcareous clays ("tegels").

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