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# Geology of the Middle Miocene Korytnica basin (southern slopes of the Holy Cross Mts, Central Poland) in the light of geophysical data and photogeological analysis

ABSTRACT: Interpretation of vertical electrical soundings and analysis of radar images and aerial photographs allow to recognize the structure of the Middle Miocene (Badenian) Korytnica basin, southern slopes of the Holy Cross Mts, Central Poland. The opinion about tectonical control of the Korytnica basin is presented. The basin was established as a result of the action of Alpine faults and rejuvenation of Laramide faults. In the centre of the Korytnica basin an oval depression, attaining about 80 m, is situated. This depression is divided from the low of Korytnica village by narrow pre-Miocene substrate ridge. The clay deposits filling the basin are an almost isometric lithosome, and its partly syntectonical character is postulated. The sedimentation of the brown-coal deposits and the green clays, being the lower members of whole sequence, shows no connection with the Badenian transgression. Two zones can be distinguished in the basin: shallow north-eastern and deeper south-western zone. The lack of the hyphothetical Jawor ridge suggests that isolation of the basin from the open sea was only of hydrodynamic nature.

## INTRODUCTION

The geoelectrical and photogeological investigations, undertaken to determine the structure of the Korytnica basin (Middle Miocene; southern slopes of the Holy Cross Mts, Central Poland), were carried out during the Chęciny Geological Mapping Course for the students of the Warsaw University in 1979 and 1980. The 52 electrical soundings (localization in Text-fig. 1) were done and the descriptions of 9 boreholes drilled in 1931—1932 by the Polish Geological Survey (*PIG*) under the supervision of J. Czarnocki (localization in Text-fig. 1) were also used. The analysis of aerial photographs and radar images was possible due to the courtesy of Docent J. Bażyński and M. Wilczyński, M. Sc. (Geological Survey of Poland) who provided the radar images. The authors

are indebted to Dr. S. Ostaficzuk who kindly lent the *Landsat-2* image of the investigated area. Thanks are also due to Z. Krysiak, M. Sc. for fruitful discussion on tectonics. Special thanks are due to B. Marciniak. M. Sc. for assistance in field work.

## GEOLOGICAL SETTING OF THE KORYTNICA BASIN

The Korytnica Bay, with its terminal part called the Korytnica basin (Radwański 1969, Bałuk & Radwański 1977), developed during the Middle Miocene (Badenian) transgression onto the southern slopes of

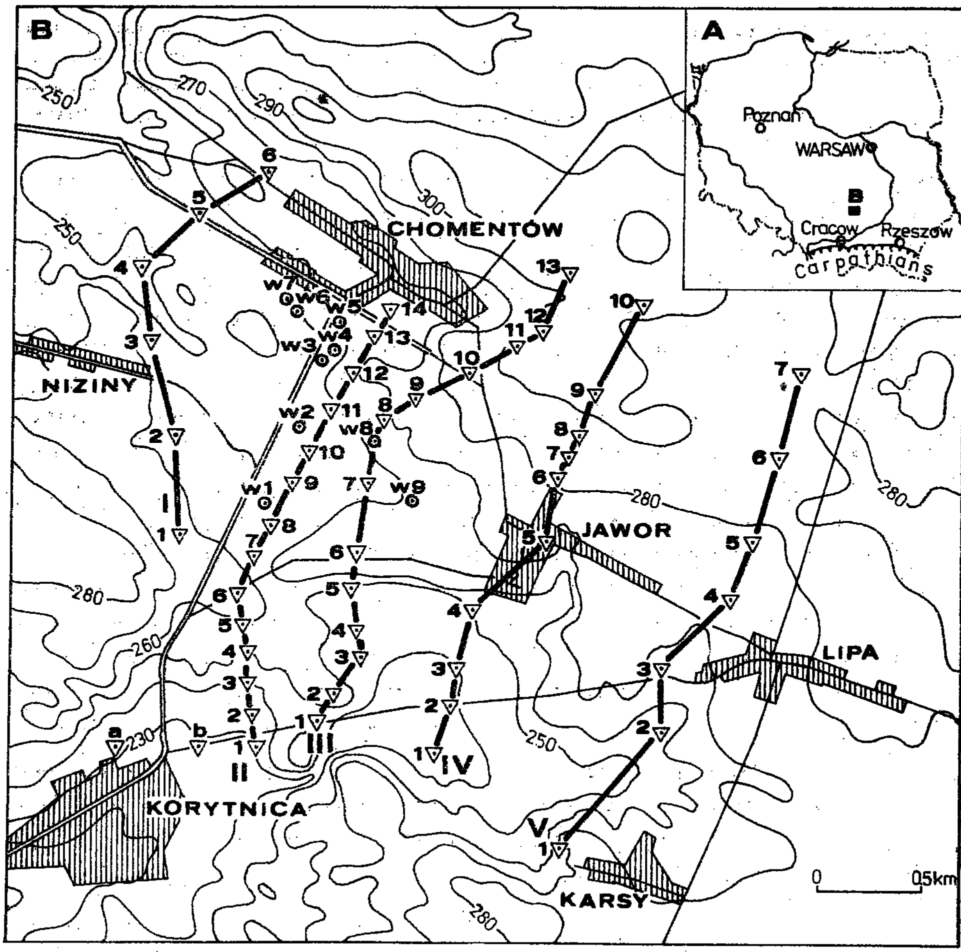
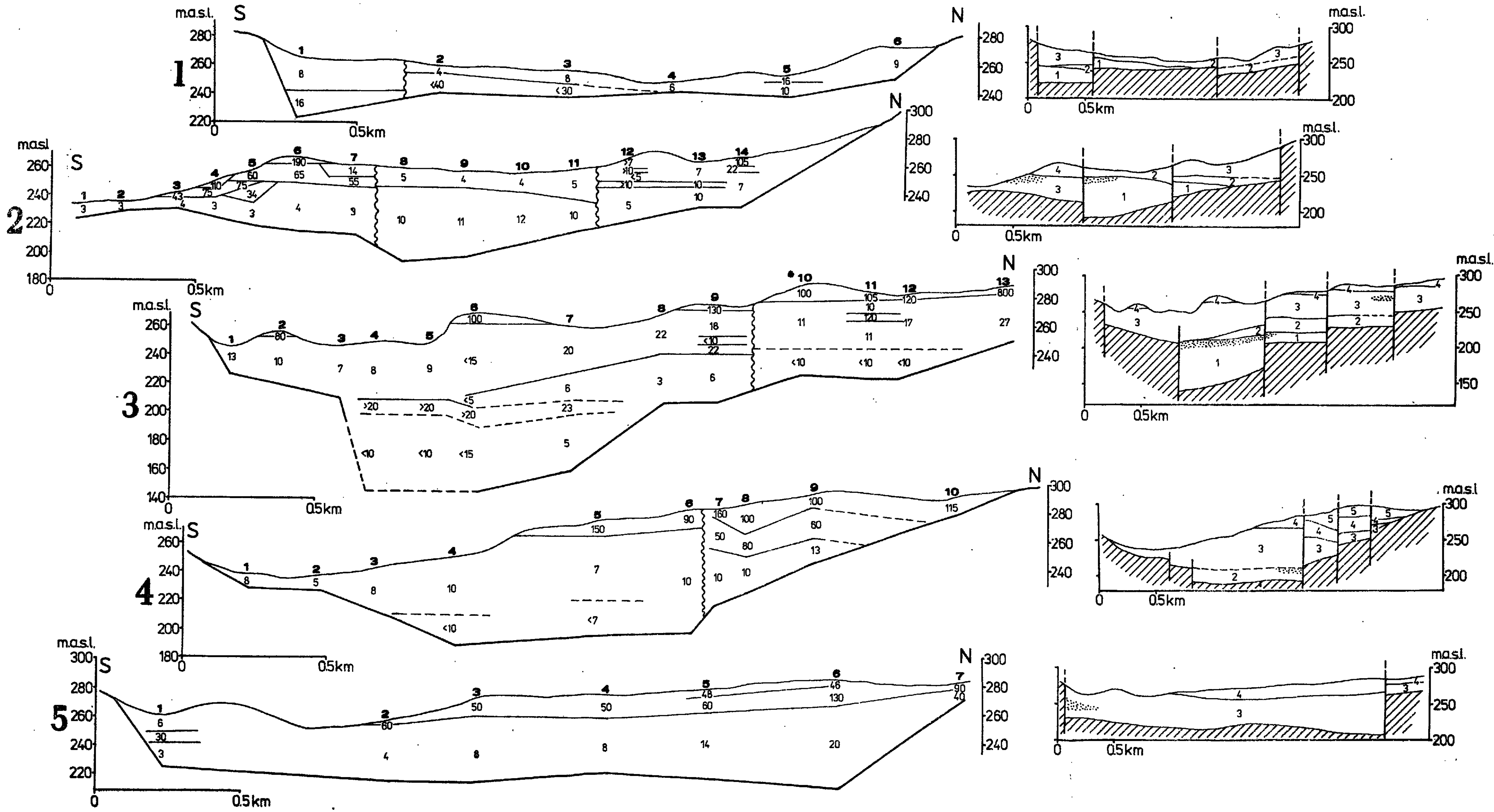



Fig. 1. Sketch map of the study area of the Korytnica basin showing location of geoelectrical profiles (thick lines); Roman numbers of the profiles (*I—V*) correspond with Arabic ones (*1—5*) in Text-fig. 2; indicated are electric soundings (*triangles*) and boreholes (*circles*)

Physical cross-sections through the Korytnica basin (1-5—see Text-fig. 1; numbers denote the resistivity value and position of electrical soundings) and their geological interpretation




1 — brown-coal deposits, 2 — green clays, 3 — Korytnica Clays, 4 — marls, 5 — lithothamnian limestones; stippled are sand bodies, dashed is the Mesozoic substrate

the Holy Cross Mts [1]. The Badenian transgession and later structural changes have been placed upon the structural framework formed during the Late-Cretaceous (Laramide) folding.

In the area of Korytnica and Chomentów, the substrate of Miocene deposits is composed of Oxfordian limestones, Kimmeridgian limestones and clays, and Albian-Cenomanian sandstones. The Korytnica basin is situated on the Laramide anticline of Sobków.

This anticline is symmetrical with the dip of limbs about 20°, trending parallely to predominant Laramide trend NW-SE and it is fading out near Korytnica (Stupnicka 1972). The substantial elements of the geological framework of the investigated area are the numerous faults, as well longitudinal as transverse to the Laramide structures. Another important structural element is the Poznań—Rzeszów lineament running not far to the north from the Korytnica basin (*cf.* Ostaficzuk & Pszczółkowski 1978).

In the Paleogene, after the Laramide folding and successive uplift of the area, the subsequent valley network was set up by vadic erosion as well as karstification (*cf.* Radwański 1969, Lindner 1977). During the Middle Miocene transgression the valley network was transformed into a system of bays, characteristic of the Dalmatian-type shoreline (Radwański 1969).

The Middle Miocene sedimentary sequence of the Korytnica basin has been well recognized and it may be summarized as follows (*cf.* Radwański 1969, Bałuk & Radwański 1977). The sequence begins with locally developed series of brown-coal deposits: black clays, sandy clays and quartz sands with intercalations of lignite and accumulations of carbonized wood. The brown-coal deposits are covered by a wider spread of green clays and in some places the mutual interfingering of these two members is visible. These deposits underlay ashen-yellow marly clays containing the world-famous fauna, and called the Korytnica Clays. By turns, overlying are sands (the *Heterostegina* sands, thought to be a local facies of the Korytnica Clays), sandy marls and in the highest part of the sequence the lithothamnian limestones. The whole Korytnica basin marine sequence is evidently of Badenian age (Martini 1977). The gravels lying above the described sequence in the environs of Jawor have been assigned to the Sarmatian (Kowalewski 1930, Filonowicz 1965), Badenian (Radwański 1969), Badenian and Sarmatian (Rutkowski 1976).

Locally, particularly near Niziny (*cf.* Text-fig. 1), the Miocene deposits are covered by Quaternary sand sheets, which demonstrate such a high resistivity that it made impossible to do electrical soundings in the western part of the basin.

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[1] The authors use this term in slightly different sense than Radwański (1969) and Bałuk & Radwański (1977) who treated the Korytnica basin as an isolated part of the Korytnica Bay. This paper considers the Korytnica basin only as an area between Korytnica, Niziny, Chomentów, Lipa and Karsy, having the paleogeographical and space evolutional questions open in the analytical part of this paper.

## GEOELECTRICAL INVESTIGATIONS

The vertical electrical soundings (*VES*) were done in Schlumberger arrangement with configuration of current electrodes AB/2 ranging from 1.6 m to 320 m.

The interpretation was made by two methods. The first was based upon a study of *VES* field curves by using the sets of theoretical two-layer and three-layer master curves and auxiliary point charts to determine the resistivity and thickness of different horizons. The second method consisted in the fixing of the longitudinal conductance $S$ (*see* formula *1* below)

$$S_c = \sum_{i=1}^{n} \frac{h_i}{\varrho_i} \quad , \Omega^{-1}$$

where: $S_c$ — longitudinal conductance of $\underline{n}$-layer complex

$h_i$ — thickness of $\underline{i}$-layer

$\varrho_i$ — resistivity of $\underline{i}$-laye

$n$ — number of layers

or

$$S = \frac{H}{\varrho_*} \quad , \Omega^{-1}$$

where: $S$ — total conductance of all layers above the highly resistant bed

$H$ — thickness of all layrs above the highly resistant bed

$\varrho_*$ — longitudinal resistance of given complex

directly from the given *VES* field curve (Szymanko 1966). The results of the both methods were put together into a plot of the longitudinal conductance against the thickness of the studied lithological complex obtained from the master curves interpretation. The dependence has a linear character in the investigated area. The same plot was set together for parametrical soundings carried out near boreholes. The divergence between two plots was ascertained hence the reduction of depth model was introduced according to the formula *2*:

$$h = S\,(1.37 - 0.70) \quad , m \quad ; \quad \varrho_* = 13.7\ m$$

$\varrho_*$ from parametrical soundings = 7.0

for the area where the marls and lithothamnian limestones are overlying the Korytnica Clays, and according to formula *3*:

$$h = S\,(0.91 - 0.51) \quad , m \quad ; \quad \varrho_* = 9.1\ m$$

$\varrho_*$ from parametrical soundings = 5.1

for the remaining area, in both cases having fixed the longitudinal conductance.

The graphical method of determining the longitudinal conductance was made possible by the fact that the pre-Miocene substrate is characterized by considerably higher resistivity than overlying clay deposits. The value of the longitudinal conductance in the Korytnica basin is influenced essentially by thick, low-resistivity series of clay deposits, the brown-coal ones as well as the Korytnica Clays. By turns, taking into account the smaller thickness and higher resistivity of marls and lithothamnian limestones it may be assumed that these deposits have not influenced the value of the longitudinal conductance significantly. Thereby, in the Korytnica basin, the longitudinal conductance is a function of thickness of the clay series filling the basin. Consequently, the space model of the longitudinal conductance may be considered as a model of regional trends of thickness changes within the clay series, since the graphical method of determining the S is a medial estimation and it is known that the vertical electrical sounding is not of an entirely point character [2].

It is striking that in the obtained space model of the longitudinal conductance (Text-fig. 3) the thick accumulation of clay deposits is an isometric lithosome situated in the centre of the basin and slightly elongated towards the axis of the basin, *i.e.* south-eastwardly.

The depth data determined from the master curve method and reduced adequatly were used to make a pre-Miocene substrate structural map (Tex-fig. 4), which is the result of mechanical interpolation only, because of medial estimating, "denuding" morphological escarps character of the method. The map corresponds to the map of longitudinal conductance (Text-fig. 3). An oval, slightly elongated toward SE, plunging about 80 m in comparison with the bottom of pre-Miocene valley, depression is visible in the centre of the Korytnica basin. The main depression is separated from another depressional low of Korytnica village by a narrow ridge, being the continuation of the Jurassic substratal ridge (*cf.* Text-fig. 4). To the north-east of Chomentów a structural embayment is also visible. Notwithstanding a hypothetical Chomentów-Jawor ridge, having been the substantial element of the previous studies (Radwański 1969, Bałuk & Radwański 1977) and believed to have been the reason for isolation of the Korytnica basin from the remaining part of the Bay can not be observed on the structural map. It results from the presented data that the Korytnica basin had not been isolated from the rest of the Korytnica Bay in that way.

The results of *VES* interpretation were put together into physical cross-sections (Text-fig. 2) showing the main features of the structure of the basin and the facies relationship between lithological units of the Miocene sequence. In some cases it was impossible to divide the sequence basing on the *VES* data, mainly within the clay series. However, having considered the borehole data the efforts to keep continuity of certain boundaries during geological interpretation might have been undertaken. Consecutive members of the Miocene sequence can be characterized by following resisitivity values:

- black clays with intercalations of lignite, sometimes together with quartz sand layers 5—12 (40) Ωm;
- quartz sands marking the boundary between black and green clays 20 Ωm;
- green clays 3—8 Ωm;
- the Korytnica Clays 3—28 Ωm (higher values of resistivity are connected with the oyster shellbed — a littoral facies of the Korytnica Clays);

[2] The equipotential surfaces of electric field generated by given current electrodes arrangement are refracted due to anisotropy of stratified earth loosing elipsoidal character. Consequently, the measured resistivity value depends upon geometry and resistivities of all the elements occurring in the given field.

— the *Heterostegina* sands 34—75 Ωm;
— marls 55—190 Ωm;
— lithothamnian limestones 100—800 Ωm.

The pattern of physical boundaries and borehole data indicate that there are close facies relationships between brown-coal deposits and green clays and between the Korytnica Clays and overlying deposits, especially the *Heterostegina* sands, whereas the facies relationship between the Korytnica Clays and underlying deposits is not visible. The Korytnica Clays have overlapped the brown-coal deposits and the green clays lying, in places, directly on the Mesozoic substrate, what was noticed by Kowalewski (1927). It confirms the assumption about the duality of the Korytnica Miocene sequence (Czarnocki 1932, 1933, 1935), consequently, in the following part of this paper the brown-coal deposits with the green clays and the Korytnica Clays with overlying deposits will be discussed as two separate sedimentary episodes.

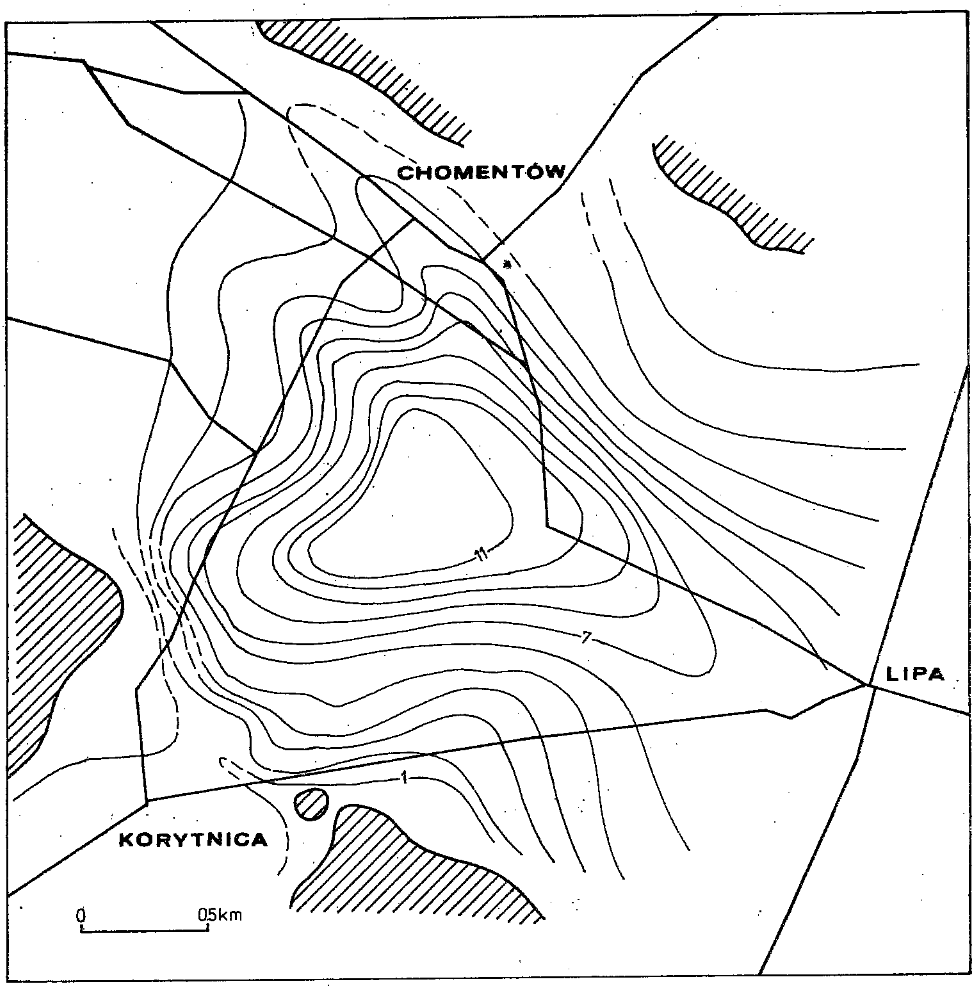


Fig. 3. Longitudinal conductance map; contour interval 1 $\Omega^{-1}$; dashed are outcrops of the Mesosoic substrate

Visible on physical cross-sections (*cf.* Text-fig. 2) certain sharp physical boundaries (marked by vertical wavy lines), displacements of some layers to each other and substantial grades in the Mesozoic substrate morphology may be interpreted as dealing with faulting, both syn- as well as postsedimentary. The action of the synsedimentary faults is emphasized by the development of high-resistivity coarse sediment intercalations closely to the fault surface

## ANALYSIS OF AERIAL PHOTOGRAPHS AND RADAR IMAGES

The aim of using the photogeological and remote sensing methods was to recognize the tectonical framework of the Korytnica basin. Both methods are complementary to one another. The radar images (1 : 100 000) analysis allowed

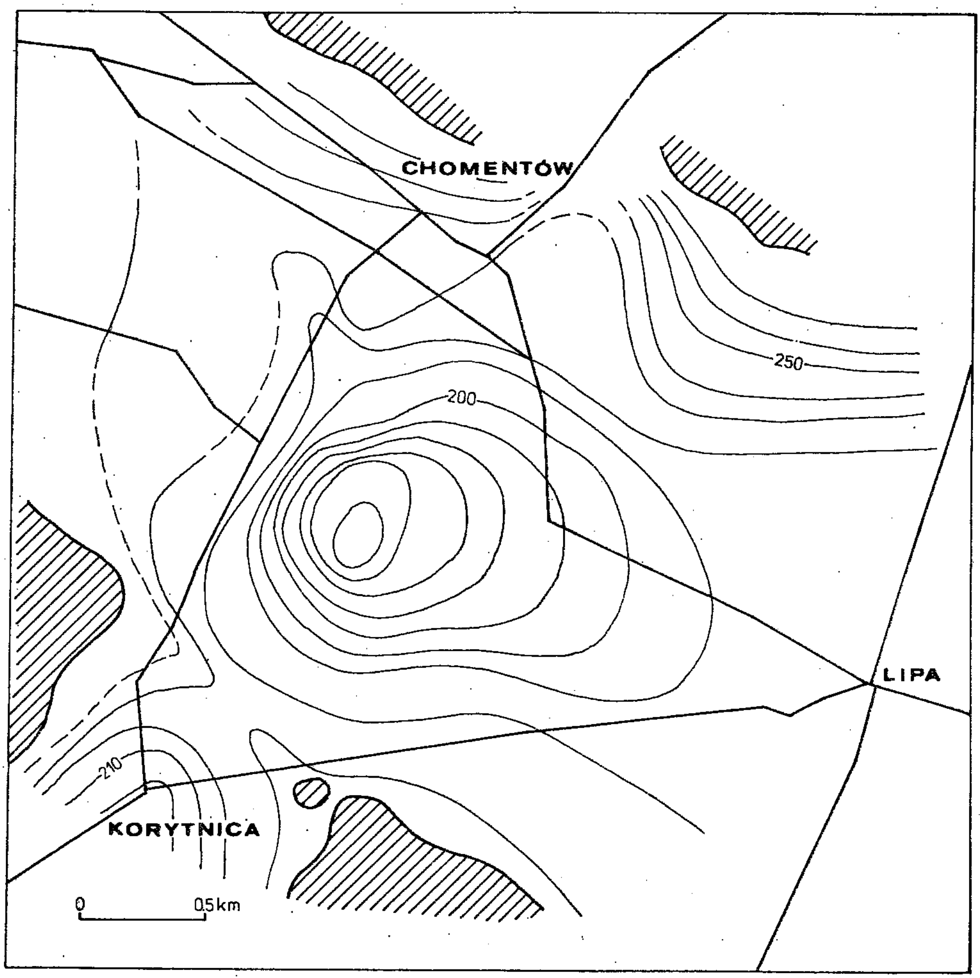


Fig. 4. Mesozoic substrate structural map; contour interval 10 m; dashed are substrate outcrops

to reveal the main, in comparison with these visible on aerial photographs (1 : 20 000), tectonical elements. The analyzed radar images were obtained from lateral scanning radar in *TOROS* system, where the horizontal wave polarization brings out all linear elements, so the radar images can be useful in recognizing tectonical trends. Some disagreements in the radar and photogeological lineaments course may have been brought about by "spreading" of radar image in scanning direction.

Considering the tectonical trends reflected by radar lineaments (Text-fig. 5*B*) the investigated area can be divided into two parts. In the first, west of the Korytnica-Chomentów line, the faults parallel to the Laramide structures are visible. The faults are trending 120—140° and have probably dip-slip character (Stupnicka 1972). In the north-west of Chomentów, as the result of the Alpine rejuvenation of these faults, the fault trough filled by Miocene sediments originated. The set of Laramide transverse faults, primarily dip-slip ones (Stupnicka 1972), trending 40—70° is also visible. The Alpine rejuvenation gave them the oblique slip character. One of the transverse faults, having slightly more complicated course forms a boundary of the western part of the basin. These trans-

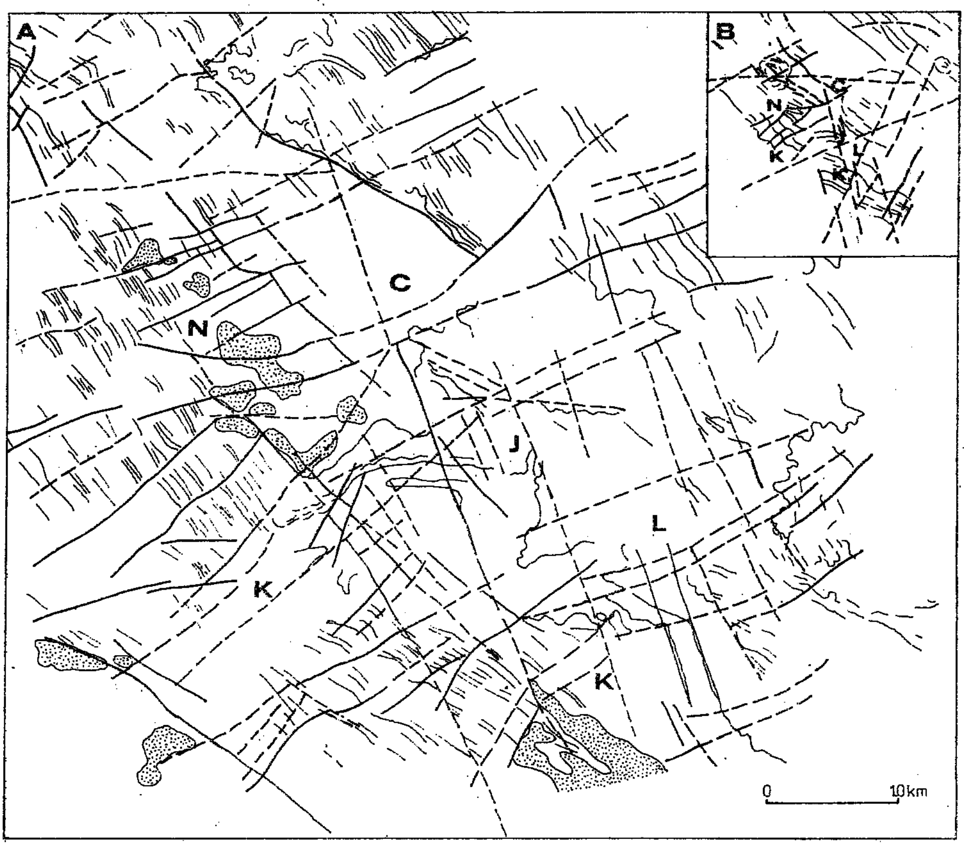


Fig. 5**A** — Photogeological map of the investigated area: thin lines — lineaments corresponding to lithological boundaries, thick lines — lineaments related to faults; stippled are Pleistocene sand sheets; abbreviated are names of villages (*cf.* Text-fig. 1)

**B** — Radar lineament map of the investigated area; explanations the same as for Text-fig. 5*A* verse faults are clearly visible also on the *Landsat*-2 image (*cf.* Ostaficzuk & Pszczółkowski 1978). Noticeable to the north of Chomentów is a big parallel to latitude lineament, part of a greater zone (*cf.* Studencki & Wilczyński 1980).

In the second part, to the east of the Korytnica-Chomentów line the system of probably complementary lineaments is visible (also on *Landsat*-2 image) and it may be divided into two sets: 25—30° and 160—170°. The angle between these sets averages about 40°, so it is a conjugate shear system with the axis of maximum stress trending 5—10°. In the eastern of the investigated area a large lineament trending 70° is also visible (*cf.* Text-fig. 5*B*).

The photogeological analysis allowed to complete data from interpretation of radar images. In the western part of the basin abundant faults longitudinal and transverse to the Laramide structures are observed. The great amount of transverse faults with distinct horizontal component trending 60—70° is noticeable The eastern part of the investigated area is more complex: there are visibly only 150—170° lineaments from the cojugated 25—30° — 160—170° system. The distinct effect of the strike-slip movement along these discontinuities is lacking so it may be supposed that the mentioned system has been developed only as a fracture system. These fractures have, in places, a dip-slip fault character, engaging the Miocene as well as the Quaternary deposits, resulting from rejuvenation. In the eastern part of the basin the set of strike-slip faults trending 60—80° is also visible.

The starting point for tectogenetic considerations is an after-Laramide folding structural pattern of the dip-slip longitudinal and transverse faults. This pattern was overlapped by two generations of the Alpine discontinuities. The photogeological analysis shown the strike-slip 60—80° fault set older than conjugated fracture 25—30° — 160—170° system. The strike-slip 60—80° faults originated as a result of the uplift of the Nida horst which had been developing since the lowest Tertiary (Osmólski & *al.* 1978). Generated in such way the stress system with maximum stress axis trending perpendicularly out of the horst in azimuth about 55° caused also rejuvenation of the Laramide transverse faults giving them an oblique slip character. All those data area in agreement with these from the Busko area (Osmólski & *al.* 1978) where the Nida horst uplift originated the same strike-slip fault set. It should be stressed that during the strike-slip displacement the vertical component of fault movement would have been originated (Lensen 1958, *fide* Jaroszewski 1981). This procees had been accomplished by gravitational rejuvenation of longitudinal Laramide faults in effect of horizontal to vertical position changes of maximum stress axis, and such a complex genesis of the Korytnica basin is presumed.

The youngest (Sarmatian?) in the investigated area is the conjugated fracture 25—30° — 160—170° system. The system indicates the compression in azimuth about 10°, which may have been connected with numerous lineaments trending 100° (*e. g.* north of Chmielnik; *cf.* Ostaficzuk & Pszczółkowski 1978). The uplift of block originated as a result of 100° lineament activity might have brought about a compression along azimuth 10° out of the block. The main characteristic of these lineaments is an échelon pattern along the large Poznań—Rzeszów lineament. It suggests that they originated from sinistral strike-slip movement along the Poznań—Rzeszów lineament, the tendency which arose during the Laramide folding (Świdrowska 1980). The sinistral strike-slip movement was probably connected with clockwise rotation during the Carpathian tectogenesis (Unrug 1980. Jaroszewski 1981).

It should be stressed that itemized tectonical analysis is not a subject of this paper, and the interesting zone between the Nida horst and the Poznań—Rzeszów lineament needs a more detailed tectonical investigations. The aim of this paper was only to create the framework where the unique Miocene sequence of the Korytnica basin might have been fitted in.

## EVOLUTION OF THE KORYTNICA BASIN AGAINST A BACKGROUND OF THE TERTIARY TECTONICS

The shape of the Korytnica Bay is closely connected with the Laramide structural pattern. The Badenin transgression entered a subsequent valley. Also the regional depression flooded by the Badenian sea is subsequent to the Laramide structures. This depression, called the Połaniec depression (Czarnocki 1935) deals with the Tertiary tectonical weakening of the Poznań—Rzeszów zone (Pożaryski 1971). The Korytnica basin is situated on the continuation of the Połaniec depression, but there is no junction between, because the north-western end of the depression is nearby the Kije-Suliszów line (Jurkiewicz 1970), *i. e.* about 6 km east from the basin. The Korytnica basin is a local structure both considering its tectonical framework and its facies development. The geological history of the basin may be divided into two periods: the period prior to the Badenian transgression, with sedimentatin of brown--coal deposits and green clays, and the period of marine Badenian sedimentation. The sedimentation during these two periods and facies pattern were strongly affected by the Alpine fault tectonics, slightly varied in character during the basin history.

The oval depression between Korytnica, Chomentów and Jawor, filled by brown-coal deposits was situated at the centre of a pre-Miocene valley and was established as a result of the action of a vertical fault component connected with strike-slip movement of 60—80° faults and in effect of rejuvenation of the transverse Laramide faults, in the same stress pattern. The longitudinal Laramide faults maintained a dip--slip character during rejuvenation and as a result the oval initial depression arose. In the initial depression the sedimentation of brown--coal deposits begun, having enhanced the effect of the lowering, which reached about 80 m. There is a lateral facies transition between brown--coal deposits and green clays towards NE making a differentiation of a basin during the first period. This division is stressed by a greater development of lignite layers in the north-eastern part of the basin (Czarnocki 1932). The brown-coal/green-clays izopach map (Text-fig. 6) points out the relationship between the sedimentation and fault tectonics.

There are certain premisses allowing to treat the green clays as a transitional sediment between brown-coal deposits and marine Korytnica Clays, as sometimes the boudary between is only marked by colour change (Czarnocki 1932). However, when considering the presented data it is difficult to agree with the opinion that the brown-coal deposits were a waste reworked during the Badenian transgression (Radwański 1967, 1969). Taking into account the fact that the brown--coal deposits do not occur around described depression together with quite a large thickness and syntectonical character of the lithosome it seems that the lack of relationship between sedimentation of the brown-coal deposits and the Badenian transgression may be assumed. Not nearer then at the verge of the Połaniec depression, at Suliszów, the brown-coal deposits were encountered in a borehole (Kowalewski

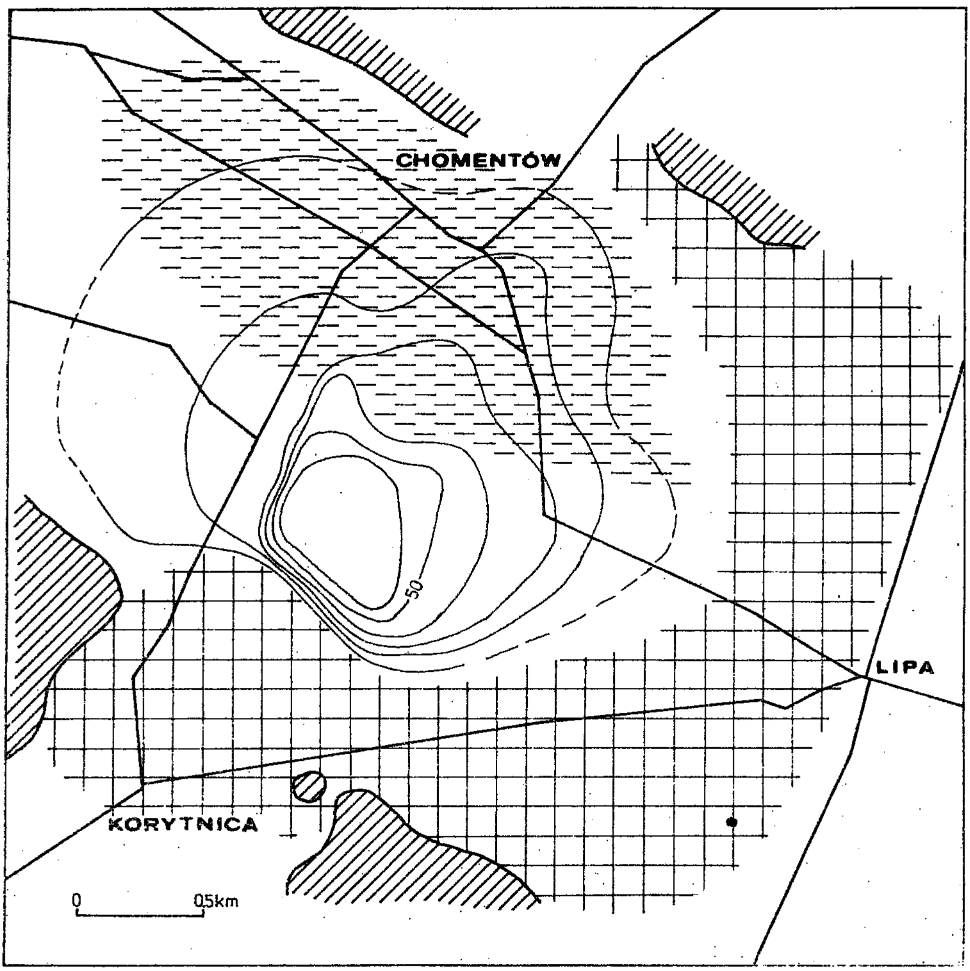


Fig. 6. Isopach map of the brown-coal deposits (green clays including); contour interval 10 m; marked by horizontal lines is the area where the green clays are thicker than the brown-coal deposits, latticed is the area where the Korytnica Clays lie directly on the Mesozoic substrate, dashed by oblique lines are the substrate outcrops

1927, 1930). They might have been connected to some extent with the Badenian transgression, as demonstrated by their structural position, but it should be rather supposed that only the uppermost part of the Suliszów brown-coal deposits sequence was reworked and the whole sequence originated under terrestrial conditions.

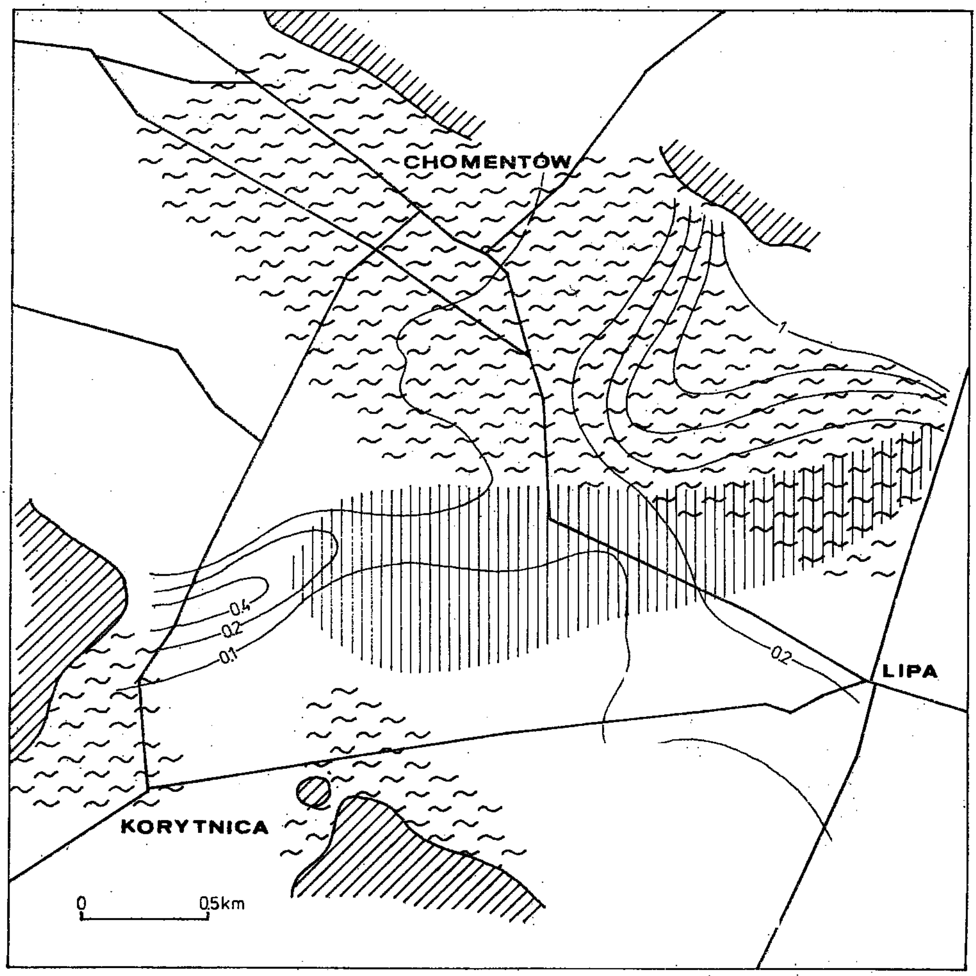


Fig. 7. Paleogeographic map for the marine sequence of the Korytnica basin. Indicate are: isolines of the ratio of thickness of marls and lithothamnian limestones to the whole thickness of the Badenian marine sequence (taking the following values: 0.1, 0.2, 0.4, 0.6, 0.8, 1.0), area of maximum thickness of the Korytnica Clays (dashed by vertical lines), area where accumulation of the oyster shellbed prevailed during sedimentation of the Korytnica Clays (wavy dashes), substrate outcrops (dashed by oblique lines)

During the Badenian marine sedimentation only longitudinal Laramide faults were active, having imposed, in places, the course of shoreline and having determined bathymetric conditions and facies relationship within the basin. The tendency to lower the central part of the basin and to divide the basin into two parts had remained. The division of the basin is visible on the paleogeographical map (Text-fig. 7) referring to the period of the Korytnica Clays sedimentation and is reflected by difference in resistivities between the Korytnica Clays and the oyster shellbed. In the more shallow north-eastern zone the marly shellbed were deposited, while in a deeper south-western part the sedimentation of clays was prevailing. The boundary between these two zones has been parallel to the Laramide longitudinal faults direction. The increase of the clay thickness to the south-west points to the synsedimentary tectonic activity along the boundary. Such a tendency can be observed also during sedimentation of the overlying deposits. In the north-eastern part of the basin the marly deposits attain greater thickness and the lithothamnian limestones developed only in that part. The maximum thickness of each lithological member of the sequence may be estimated as follows:

— brown-coal deposits together with qartz sands 70 m (Profile *3;* soundings *4, 5, 6*),
— green clays 20 m (Profile *2;* sounding *11*),
— Korytnica Clays 50 m (Profile *3;* sounding *6*),
— marls 22 m (Profile *4;* sounding *9*),
— lithothamnian limestones 20 m (Profile 4; sounding8).

The presented paleogeographical pattern (Text-fig. 7) together with the structural map (Text-fig. 4) indicates that the Korytnica basin might have been bound to the depression between the Chomentów ridge and a parallel ridge running south of Niziny and Karsy. It confirms the main outlines of the paleogeographical reconstruction based on distribution of littoral structures (Radwański 1969), but at this point a brief discussion seems necessary.

The shoreline of the Korytnica basin may be marked approximately by using a hipsometric map only. Most of the described littoral structures (*see* Radwański 1969, Fig. 31) emphasize and state precisely the course of shoreline but equivalent treatening of the cliff rubbles lying directly near the Mesosoic outcrops (locality Korytnica *I, III,* and Chomentów *I* in Radwański 1969) or accompanied by abrasion surfaces (locality Korytnica *II, IV*) and rubbles being weathering residuum (locality Chomentów *II, IV*) and, outright, bored by rock-borers Jurassic pebbles occurring within the Korytnica Clays (locality Korytnica *V*) or within the lithothamnian limestones (locality Chomentów *III*) may lead to improper paleogeographical reconstructions. In the light of presented data it seems that the localities Korytnica *V* and Chomentów *II, III, IV* may be treated as a result hydrodynamic factors transporting big pebbles of Jurassic rock from neighboring littoral zones. It could have been storms [3], the activity of which was discussed in the previous

[3] According to such a conception the gravels occurring near Jawor are the littoral sediment of the same age as the lithothamnian limestones indeed (Radwański 1969) but they are of allochthonous nature.

studies (Radwański 1969, 1977; Bałuk & Radwański 1977). Even if the locality Korytnica V is situated above a Jurassic ridge (*cf.* Radwański 1969) after all the position of that ridge in a strait between the basin and the open sea (*see* Bałuk & Radwański 1977, Fig. 1) allows to suppose that the abrasion material was carried out into deeper parts of the basin due to intensification of hydrodynamic factors in that strait. The differences in altitude of littoral localities are difficult to interprete univocally in the presence of high synsedimentary mobility of the investigated area and inversional, in places, character of the postsedimentary tectonics.

The most important fact resulting from the research is a lack of hypothetical ridge thought to separate the Korytnica basin from the rest of the Korytnica Bay (*see* Radwański 1969, Fig. 25; Bałuk & Radwański 1977, Fig. 2). An abudance and diversity of organic communities (*cf.* Radwański 1969, 1977; Bałuk & Radwański 1977) and particurarly the facies development of the basin shows, however, that the basin had been isolated indeed. It may be supposed that the isolation was only of hydrodynamic nature, stressed by the tendency of lowering the bottom in the central part of the basin. The Korytnica basin was situated on a kind of a platform in the terminal part of the Korytnica Bay, several kilometers from the open sea. Only strong factors, as storms might have interrupted the quiet conditions prevailed in the basin and also having the littoral material carried out throught the whole bay.

The post-Badenian tectonics gave the present shape to the basin having modified particularly its western part, which has the fault-trough character as a result of rejuvenation of longitudinal Laramide faults. Tectonic engagement of Miocene deposits in the environs of Chomentów was mentioned earlier (Czarnocki 1933). The Chomentów fault trough is complex because in the central part there crop out the brown-coal deposits and the green clays testyfying to the inversive character of the block movement. In the eastern part the course of a boundary between the Korytnica Clays and marls is determined by strike-slip faults (*see* Text-fig. 5*B*). The tectonic activity has been continued through the whole Quarternary, until nowadays, what is marked by disturbances of the Pleistocene sand sheets.

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## BUDOWA GEOLOGICZNA BASENU KORYTNICY W ŚWIETLE DANYCH GEOFIZYCZNYCH ORAZ ANALIZY FOTOGEOLOGICZNEJ

(Streszczenie)

Przedmiotem pracy jest interpretacja pionowych sondowań geoelektrycznych (*patrz* fig. 1) oraz analiza obrazów radarowych i zdjęć lotniczych Basenu Korytnicy. Basen ten powstał w efekcie działania uskoków alpejskich oraz odmładzania uskoków laramijskich (*patrz* fig. 5). W centrum basenu istnieje owalna depresja zanurzająca się około 80 m w stosunku do otoczenia basenu i oddzielona od obniżenia na obszarze wsi Korytnica wąskim grzbietem podłoża (*patrz* fig. 4). Wypełniające basen osady ilaste mają charakter prawie izometrycznego litosomu (*patrz* fig. 3). Postuluje się jego syntektoniczny częściowo charakter. Przebieg granic fizycznych w obrębie basenu (fig. 2) sugeruje, że sedymentacja osadów burowęglowych i iłów zielonych stanowiących dolną część osadowej sekwencji basenu nie była związana z transgresją badeńską. Basen Korytnicy różnicuje się na dwie części, zarówno rozpatrując okres sedymentacji osadów burowęglowych (fig. 6), jak i okres sedymentacji iłów korytnickich (fig. 7). Wydzielić można płytszą część północno-wschodnią oraz głębszą część południowo-zachodnią. Wobec braku hipotetycznego grzbietu Jawora, mającego być przyczyną izolacji basenu przypuszcza się, iż izolacja taka była wyłącznie natury hydrodynamicznej.