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Outline of tectogenesis of the platform cover in the Wielkopolska area (W Poland)

ABSTRACT: Thickness maps are presented for the particular series or systems. They have been plotted on the basis of several hundreds of boreholes from the area of Wielkopolska. The analysis shows that vertical movements of subsurface blocks of the Sub-Permian substratum played decisive role in the development (evolution) of the sedimentary cover of the Epi-Variscan platform. The fault network in the analysed area is at least Late Variscan in age and has been probably rejuvenated in several phases of the Alpine cycle. The faults bordering the Wolsztyn ridge and the Poznań—Oleśnica dislocation zone are directly associated with the fractures localised in the Moho surface. Tectonic structures of NW—SE directions show association with the Middle Polish aulacogene. Their origin resulted from the distension conditions that have existed within the marginal zone of the aulacogene which favoured the development of normal faults.

INTRODUCTION

Intensive geological-prospecting works carried out in western Poland during recent twenty years allowed to recognize well the deep structure of the Fore-Sudetic monocline and of the Szczecin Basin and of the Mogilno Basin (Dadlez & Marek 1969, Dadlez & Kopik 1975, Deczkowski & Gajewska 1979, Karnkowski 1979, Marek & Raczyńska 1970, Pokorski 1978, Pożaryski & Brochwicz-Lewiński 1979, Senkowiczowa & Szyperko-Śliwczyńska 1975, Sokołowski 1967, Wagner & al. 1978, Witkowski 1979, Znosko 1979).

TECTOGENESIS OF THE PLATFORM COVER

Geophysical and geological data are abundant but irregularly distributed (concentration of boreholes around favourable structures). In Wielkopolska the number of deep boreholes per 100 square km is 1—4

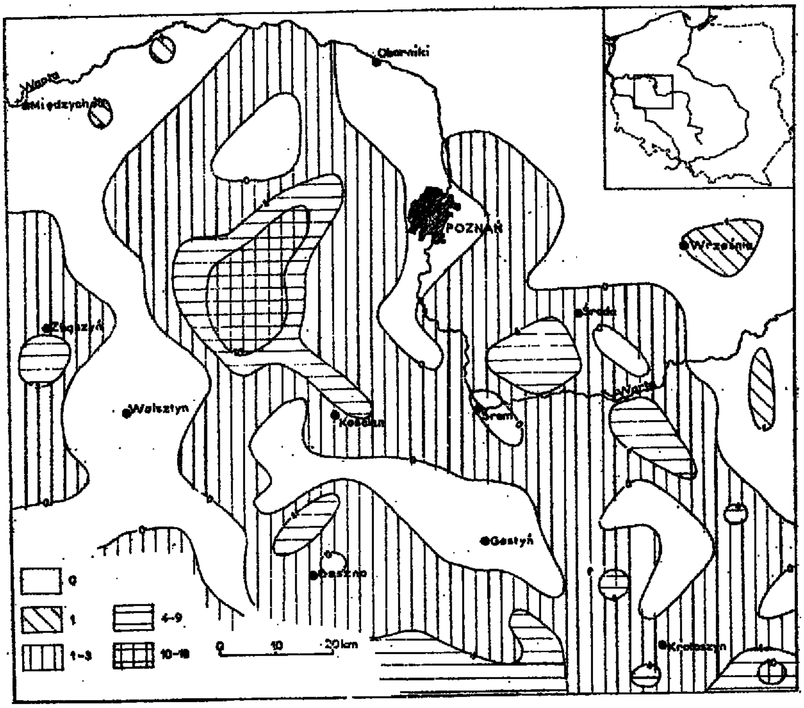

Fig. 1. Map of the number of deep boreholes (reaching at least the Zechstein) per 100 square km. State of January 1st, 1979

as a rule but it falls down to zero in some areas (Fig. 1). In an area embracing about 12,000 square km so far about 200 deep drillings have been pierced reaching at least the Zechstein and in most cases also the Rotliegendes and even the Variscan substratum. Hence the recognition of the Permo-Mesozoic complex which is a part of the Epivariscan platform allows to evaluate the Postvariscan evolution of the area and to try to restore its tectogenesis.

The litho-stratigraphic subdivisions as used in this paper are taken from the borehole documentation of the Union of Petroleum Production and Gas Industry and of the Geological Institute. Because of practical reasons the smallest unit is the series. The tectonic map of the Permian substratum makes the basis for all the thickness maps (Fig. 2). It has been done on the basis of seismic data and analysis of the thicknesses of the particular rock complexes. On that basement map the isopachytes for the particular systems and series have been plotted (Figs 3—13) assuming that the movements of the substratum blocks bordered by faults (Fig. 14) were the main factor controlling the thickness. According to Dadlez & Marek (1969) the block movements were slow and long-lasting as a rule and as compared to the total surface of the Lowland,

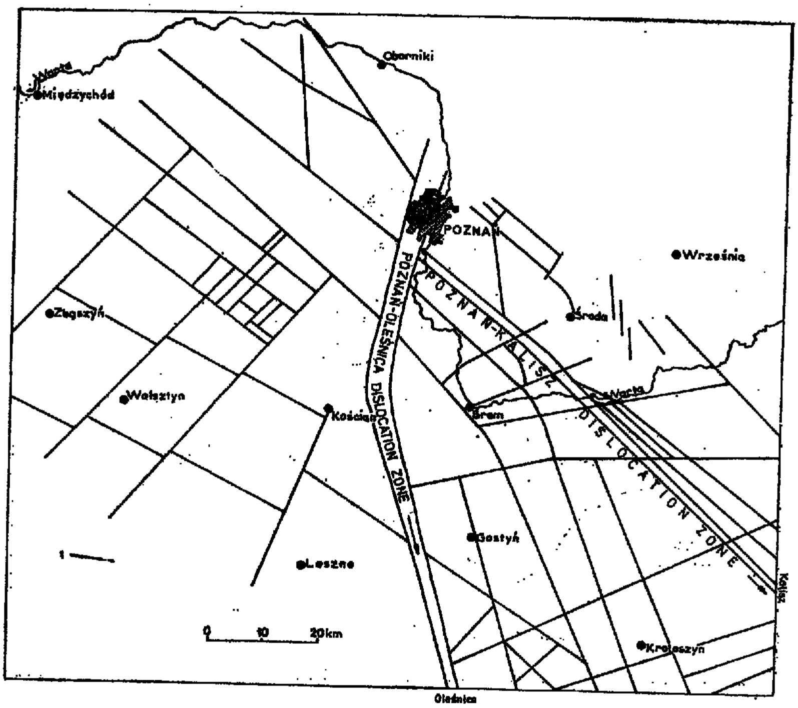

Fig. 2. Fault network in the substratum of the Permian. *1* — faults

had relatively small amplitude. They caused diversification of the rate and kind of sedimentation expressed by facies and thickness changes and development of erosion surface and sedimentary gaps.

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ANALYSIS OF MAPS AND CROSS-SECTIONS

Strongly folded and weakly metamorphosed Lower Carboniferous Culm sediments make the substratum of the platform cover in Wielkopolska (Górecka 1978, Krawczyńska-Grocholska 1978).

Precarboniferous sediments occur subordinately, first of all on elevations devoid of the Rotliegendes formations. Those are phyllites and quartzitic sandstones and quartzites lacking palaeontological documentation. Those can be Devonian or even older (Cambrian-Silurian) rocks (Witkowski 1979).

The oldest formation in the platform cover is the continental Rotliegendes consisting of sandstones and conglomerates and volcanic and pyroclastic rocks (Pokorski 1978). Large diversification of the basin and elevation was a result of active synsedimentary tectonics during the Lower Permian times (Karnkowski 1977). The Poznań—Oleśnica dislocation system running across the central part of Wielkopolska has been regarded so far as a structure developed during

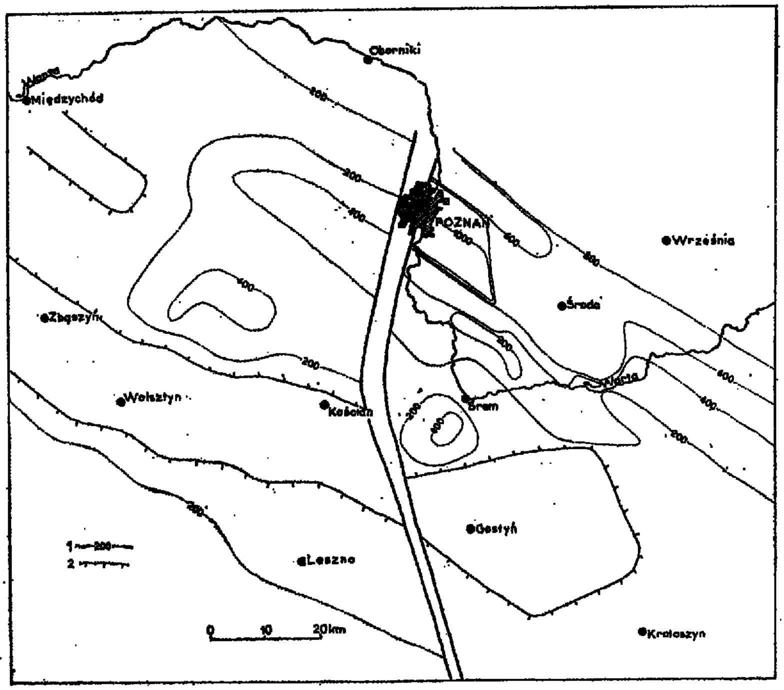

Fig. 3. Thickness map of the Rotliegendes. *1* — isopachytes in meters, *2* — extent of the Rotliegendes

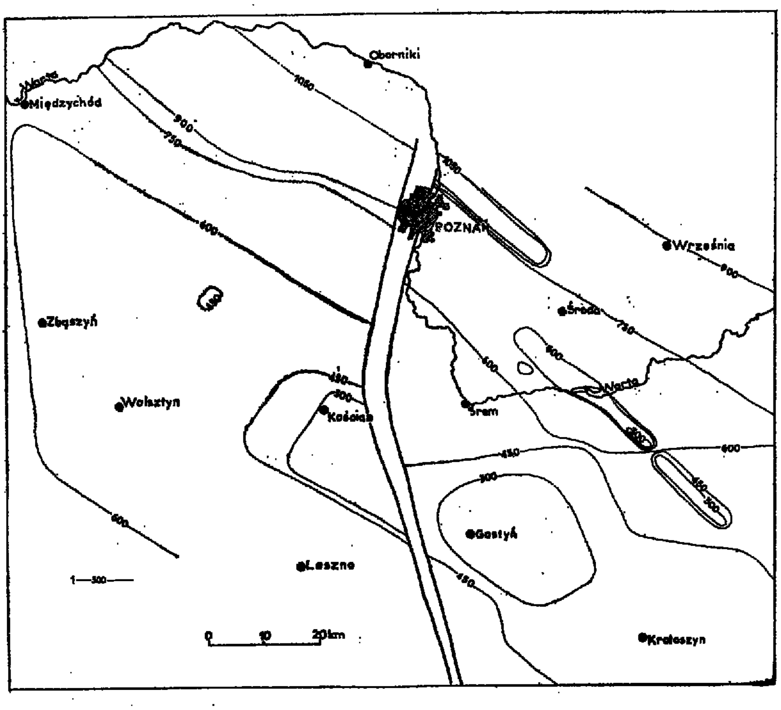

Fig. 4. Thickness map of the Zechstein. *1* — isopachytes

the Old Kimmerian movements (Deczkowski & Gajewska 1979). It has been active already in the Lower Permian which is reflected in thickness diversification on its both sides i.e. in the west and east (Fig. 3).

During the Zechstein times when a radical change of facies had taken place from the continental to marine — saline ones (Wagner & al. 1978) the subsidence rate has increased (Fig. 15) and decrease of the influence of block tectonics onto the thickness variations (Fig. 4). The Wolsztyn ridge (completely devoid of sediments during the Lower Permian) and the Poznań—Kalisz dislocation zone (showing some diversity of facies during the Rotliegendes) are elements of small subsidence (Karnkowski 1977).

Taking into account the whole Permian system one can observe that the following elements decided about the dynamics of subsidence: the Wolsztyn ridge, the Lwówek elevation, the Rokietnica elevation and the Poznań—Oleśnica and Poznań—Kalisz dislocation zones (Fig. 14).

The deposition of the Buntsandstein has been a continuation of the Zechstein deposition but the evaporites have been replaced by terrigenic sediments (Senkowiczowa & Szyperko-Śliwczyńska 1972). The mean subsidence rate of the

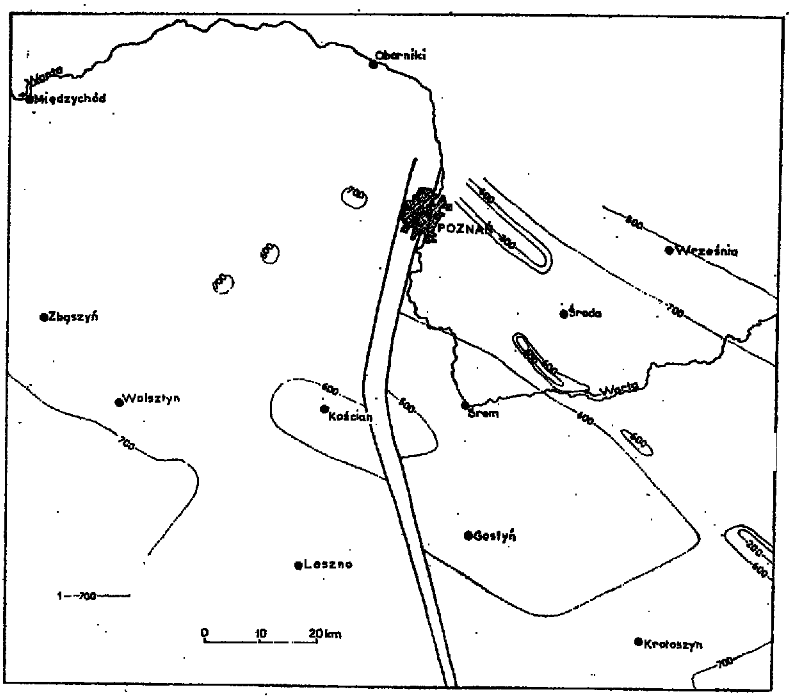

Fig. 5. Thickness map of the Buntsandstein. *1* — isopachytes

Buntsandstein has increased as compared to that of the Zechstein (Fig. 15). The Wolsztyn ridge was less prominent than before due to submergence of the western area toward the south (Fig. 5).

The Muschelkalk is characterized by very small facies differentiation and small differences in thickness. That was a period of tectonic quiescence and prevalence of carbonate facies. Active so far tectonic elements show but very weak activity in few places only which is expressed by insignificant (up to 10%) changes in thickness increase (Fig. 6).

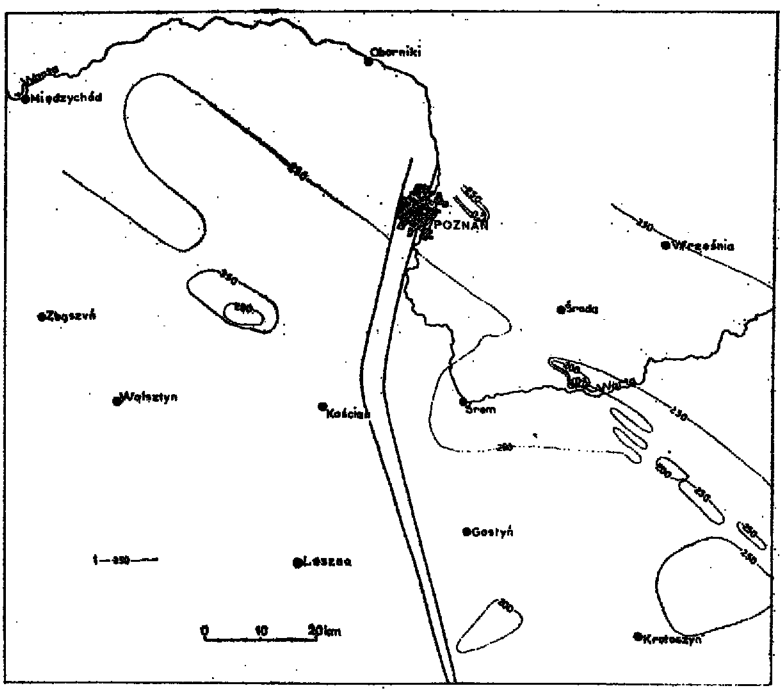

Fig. 6. Thickness map of the Muschelkalk. *1* — isopachytes

The Upper Triassic shows a retreat to fine clastic deposition of claystone and siltstone with dolomite, anhydrite and salt intercalations (Deczkowski & Gajewska 1979, Gajewska 1978). The Keuper and the Rhaetian are characterized by large subsidence rates, particularly so within the Poznań—Kalisz dislocation zone (Figs 7, 14). It is expressed by a development of a graben of considerable subsidence over twice greater than average. This tectonic reactivation has been caused by the Old Kimmerian movements the greatest activity of which had taken place at the Keuper-Rhaetian decline (Deczkowski & Gajewska 1979, Sokołowski 1967). The regional subsidence gradient at the end of the Triassic in the area of Wielkopolska is opposite to the Permian one and distinctly increased toward the south (Karnkowski 1980).

The Lower Jurassic subsidence has been a continuation of the Upper Triassic conditions (Dadlez & Kopik 1972). Clastic facies still prevailed (sandstones) with marine intercalations. The tectonics of the Lower Jurassic has been controlled by the Old Kimmerian movements. Despite the decrease of subsidence rate, the block structures definitely rejuvenated in the late Triassic in form of horsts and grabens had continued their activity in the oldest Jurassic (Fig. 8). This is particularly remarkable within the Late Triassic grabens (the area of the dislocation system Poznań—Kalisz, where subsidence is twice greater than average) and in the Lwówek and Rokietnica elevations.

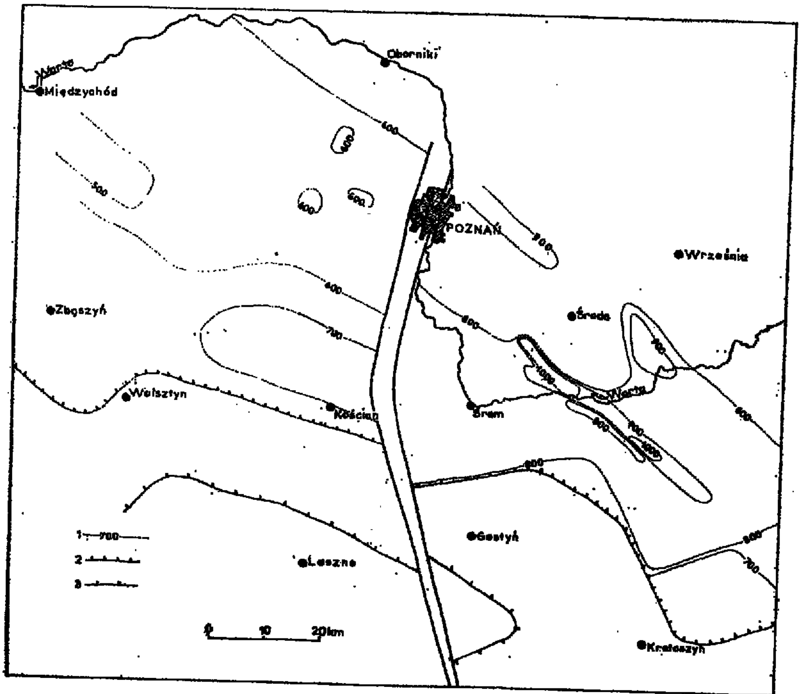

Fig. 7. Thickness map of the Upper Triassic (Keuper and Rhaetian)
1 — isopachytes, 2 — present-day extent of the Lower Jurassic, 3 — present-day extent of the Rhaetian

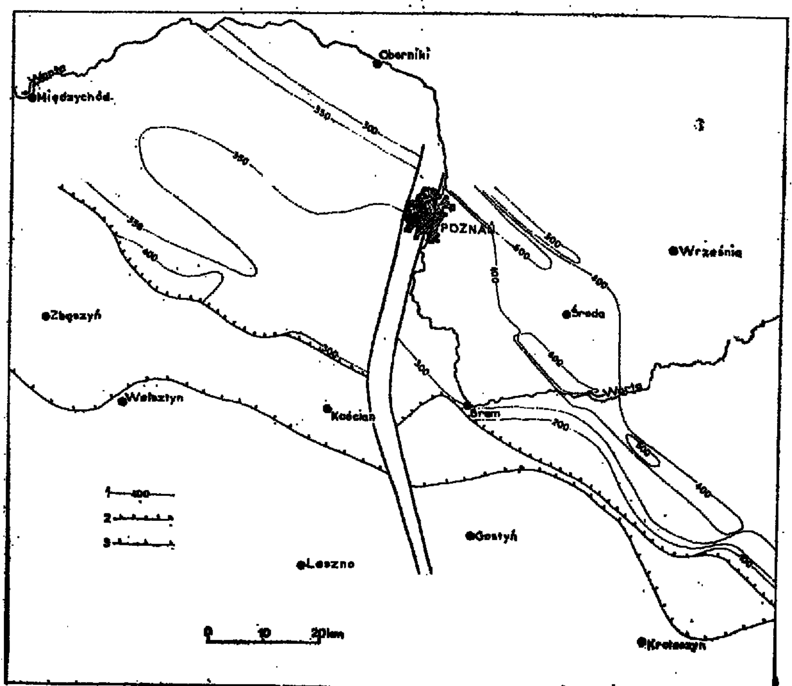

Fig. 8. Thickness map of the Lower Jurassic
1 — isopachytes, 2 — present-day extent of the Middle Jurassic, 3 — present-day of the Lower Jurassic

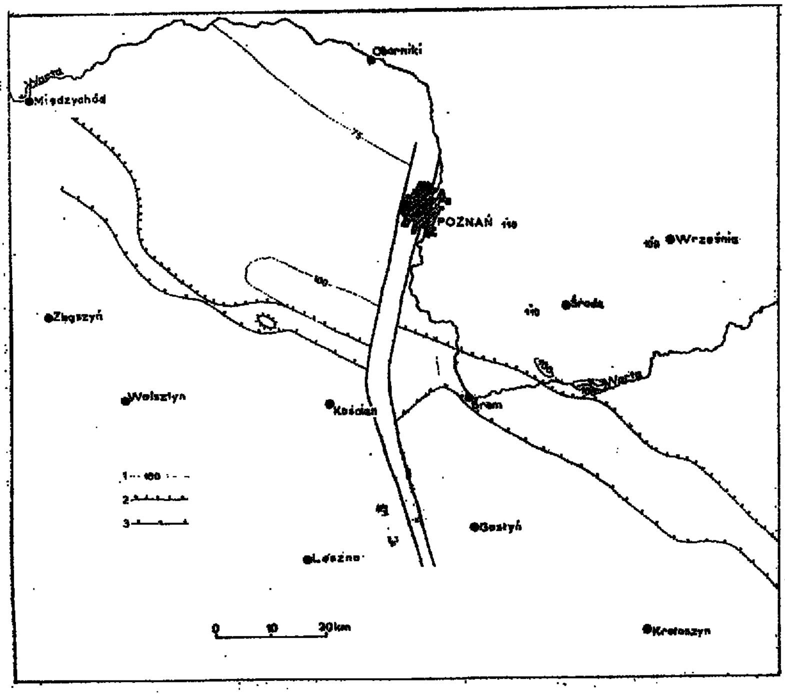

Fig. 9. Thickness map of the Middle Jurassic
1 — isopachytes, 2 — present-day extent of the Upper Jurassic, 3 — present-day extent of the Middle Jurassic

The Middle Jurassic shows very small thickness differentiation in the area of Wielkopolska (Fig. 9) which together with even smaller subsidence velocity than in the Lower Jurassic (Fig. 15) proves tectonic quiteness. Despite that quiteness the activity of the Poznań—Oleśnica dislocation during the Middle Jurassic separates the mean subsidence rate into two areas: eastern and western ones respectively (Fig. 9).

The Upper Jurassic formations in Wielkopolska are limited in their occurrence due to Tertiary erosion. Primarily those sediments embraced immense areas, and as it is shown by facial analysis (Dadlez & Kopik 1975) reached as far as the Sudetes, and during the Oxfordian also most probably the Bohemian massif (Matyja 1977). The subsidence rate in late Jurassic has increased 2—3 times as compared to the Middle Jurassic (Fig. 15), and the tectonic rejuvenation has caused much (twice) quicker subsidence in the eastern region than in the western one (Fig. 10).

Because of practical reasons the Cretaceous system is not subdivided into smaller units in this paper. Important changes had taken place in relation to previous systems in the occurrence area. At the Jurassic-Cretaceous decline an inversion of the direction movement of the tectonic elements had taken place. In the west during the Permian, Triassic and Jurassic the subsidence was slower than in the east. During the Cretaceous times an inversion took place (Fig. 11). The Lower Cretaceous formations extend farther south on the western side of the Poznań—Oleśnica dislocation (Marek & Raczyńska 1970). During the Tertiary erosion time due to a tendency to greater subsidence of the western Wielkopol-

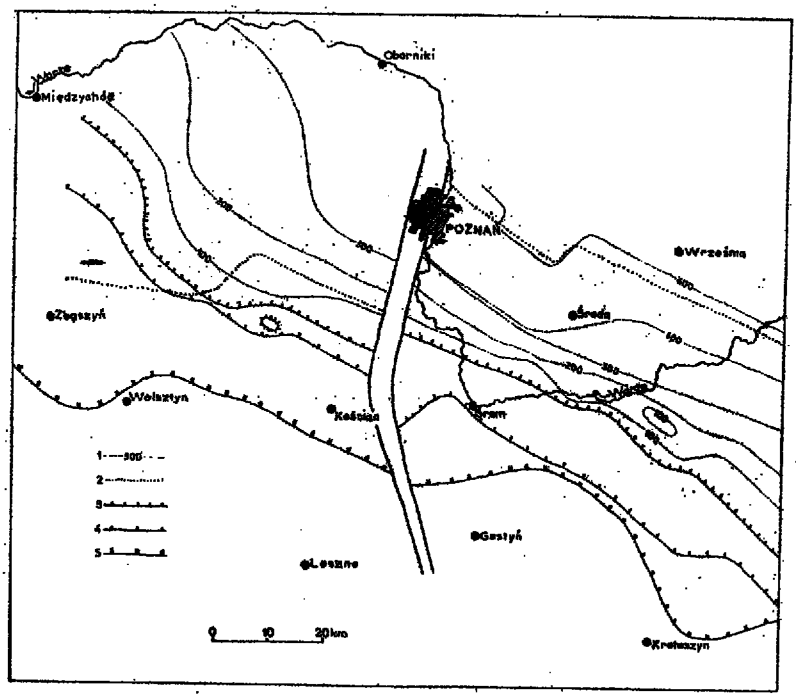

Fig. 10. Thickness map of the Upper Jurassic
1 — isopachytes, 2 — present-day extent of the Cretaceous, 3 — present-day extent of the Upper Jurassic 4 — present-day extent of the Middle Jurassic, 5 — present-day extent of the Lower Jurassic

ska there was smaller gradation in the downthrown side. Recent boundary of the Cretaceous sediments and their encroaching extent as compared to the Jurassic in the western area is also a result of this phenomenon.

At places of tectonic elements that were elevated long time as e.g. the Lwówek and Rokietnica elevation (Fig. 14) basin have been formed which were filled with Cretaceous sediments. This is an analogy to a part of the Mogilno—Łódź

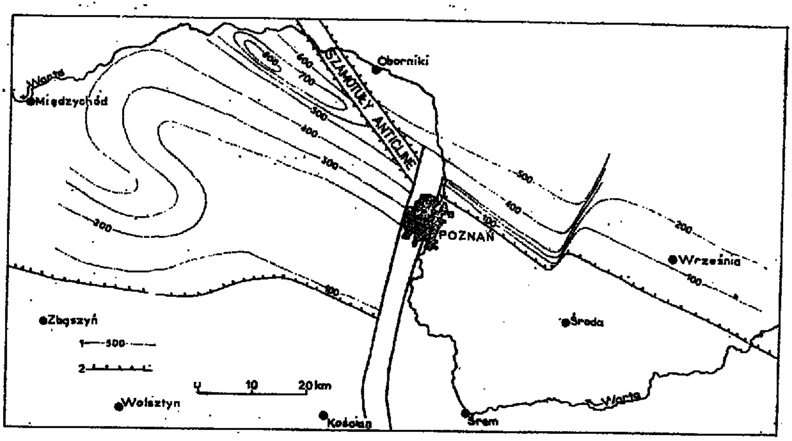

Fig. 11. Thickness map of the Cretaceous
1 — isopachytes, 2 — present-day extent of the Cretaceous sediments

basin which has originated at the place of the Wielkopolska ridge (Dadlez & Franczyk 1976). The present author is of opinion that a network of faults has been rejuvenated in Wielkopolska at the Jurassic-Cretaceous decline in result of the Young Kimmerian movements (phase). At the same time an inversion of the directions of vertical movements has been initiated in the substratum blocks. Erosion of the Triassic and Jurassic formations has been initiated during the Lower Cretaceous time. Those rock being then already monoclinally inclined. Intensification of the tectonic movements in the Upper Cretaceous was associated with the Subhercynnian phase that has caused expansion of the areas of strong subsidence off the Middle Polish aulacogene (Pożaryski & Brochwicz-Lewiński 1979) and contributed to the development of grabens within the Fore-Sudetic monocline (Pożaryski 1970).

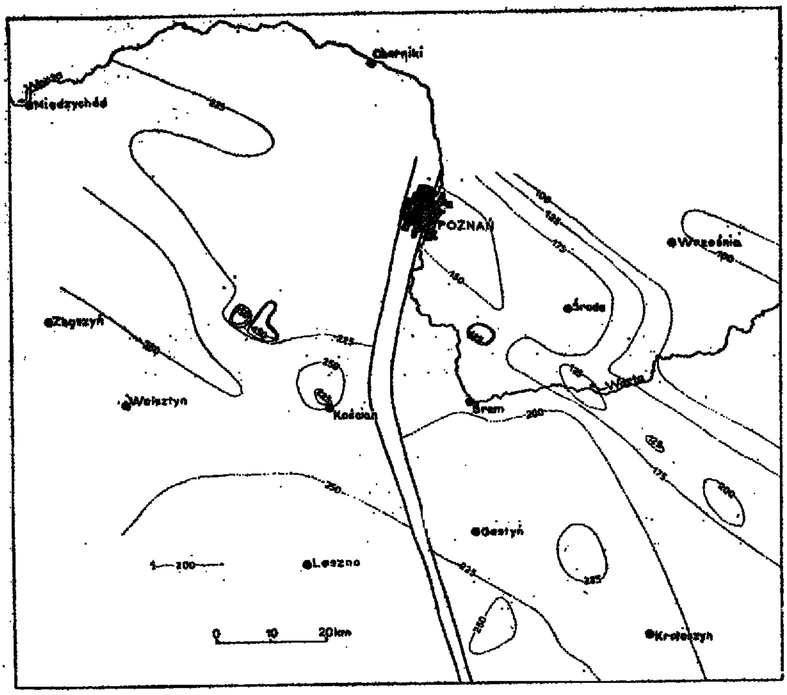

Fig. 12. Thickness map of the Cainozoic formations. *1* — isopachytes

The Tertiary and Quaternary sediments are treated together here being hardly separable in well logs sections. The Laramiam phase led to considerable erosion of the Mesozoic sediments during the Lower Tertiary has greatly influenced the recent pattern of the tectonic units. A relatively insignificant subsidence rate during the Cainozoic era points to a connection of the area of Wielkopolska with the uplift of the Middle Polish anticlinorium. The subsidence gradients point to southwest in the whole area and the western area as it was the case during the Cretaceous shows a tendency to quicker subsidence than the eastern one (Fig. 12). In the regional thickness distribution of the Cainozoic sediments there are places of anomalous increase of the volume of sediments (grabens infilled with the Miocene brown coal formation arranged along the Poznań—Oleśnica dislocation, Ciuk 1978).

In some places smaller thickness of the Cainozoic sediments can be observed (areas of Kłęka, Solec, Czmoń and Grodzisk). In such places deposits of natural gas occur within sandstones of the Lower Permian that have been definitely formed during the Tertiary (Karnkowski 1979) due to uplift of the blocks of the substratum associated with active zones during the whole development of the platform cover.

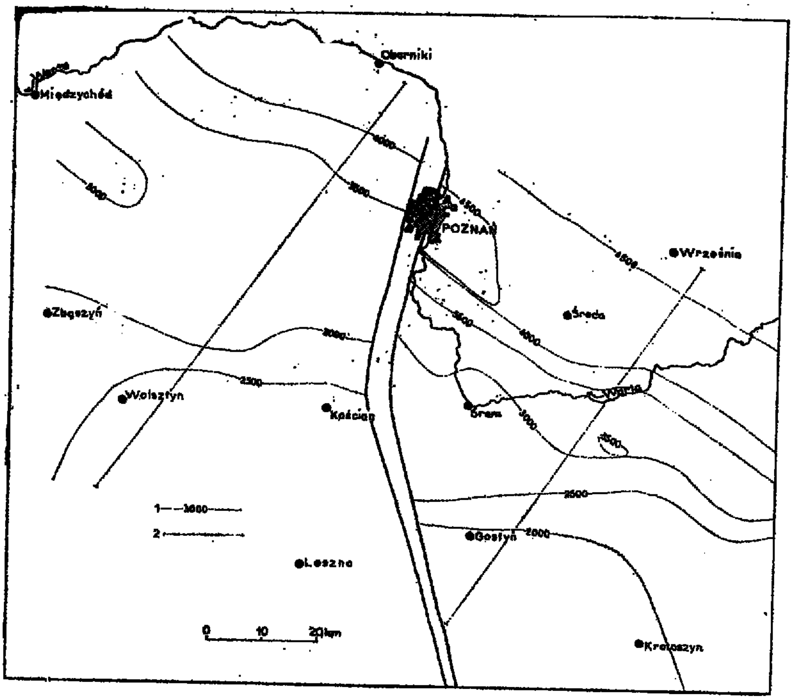

Fig. 13. Thickness map of the present-day thickness of the platform cover
1 — isopachytes, 2 — lines of palaeotectonic cross-sections shown in Figs 16—17

The role of the Poznań—Oleśnica dislocation shown on all previous maps can be also noted on the thickness map of the whole platform cover where one can notice that the regional dips differ on both sides of that dislocation (Fig. 13). Greater subsidence in the western area during the time span from the Cretaceous till now had led to partial compensation of the thickness of the platform cover in relation to the eastern area.

Analysing the map of the activities of the tectonic structures during the particular epochs or periods (Fig. 14) one may observe some regularities in the behaviour of the particular element. The Wolsztyn ridge is marked as a positive structure at least since the beginning of the Permian. Its activity decreased, however, with time and it is difficult to see it in the Muschelkalk. Most probably the Wolsztyn ridge has been reactivated again during the Laramian movements which is proved by the distinct association of recent extents and of preserved thickness of the Lower Jurassic and Upper Triassic formations with the faults bordering the ridge (Figs 10, 16—17). The Lwówek elevation has been

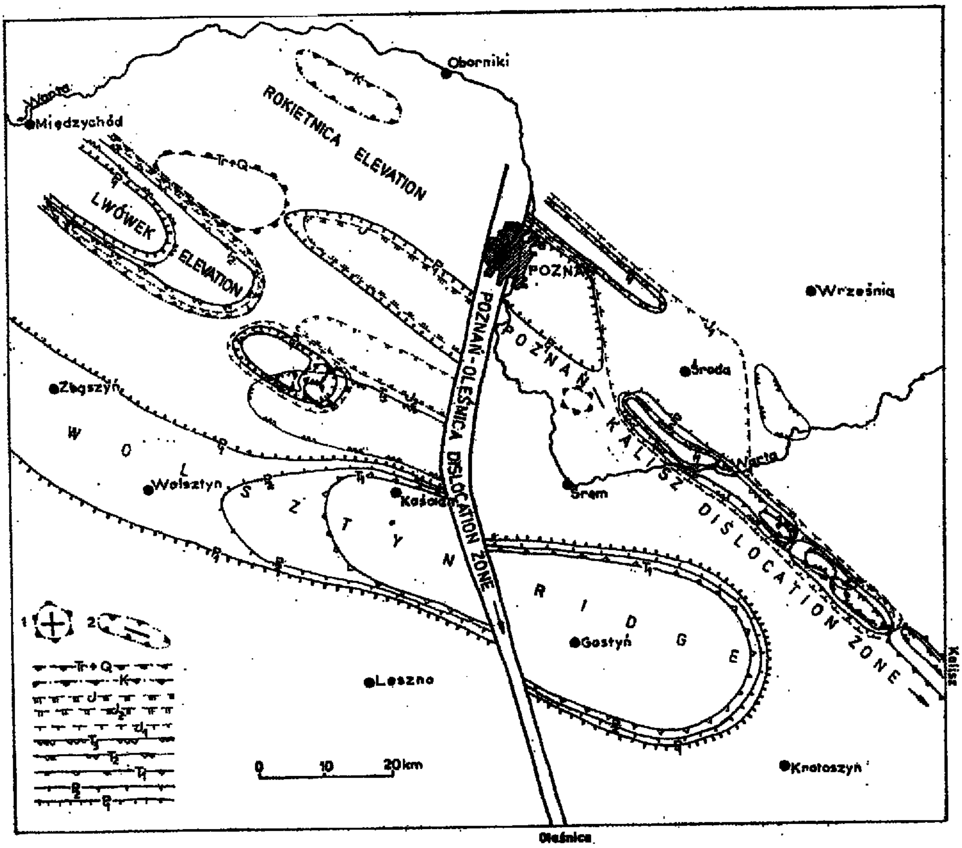

Fig. 14. Map of activities of the tectonic elements in the particular epochs and periods.

1 — marks directed outward — uplifted area, *2* — marks directed inward — lowered area, Tr+Q — Tertiary + Quaternary, *K* — Cretaceous, *J* — Jurassic, J_2 — Middle Jurassic, J_1 — Lower Jurassic, T_3 — Upper Triassic (Keuper and Rhaetian), T_2 — Muschelkalk, T_1 — Buntsandstein, P_2 — Zechstein, P_1 — Rotliegendes.

active during the entire duration of the development of the platform cover. It was a positive element since the Lower Permian till the Cretaceous (the Middle Jurassic and Upper Jurassic are partly eroded but the depression lying between the Lwówek elevation and the Rokietnica elevation has shown a depressive tendency during the whole Jurassic period). In result of the Young Kimmerian movements the directions of vertical movements reversed, and in site up to now uplifted a basin has been formed that has been then infilled with Cretaceous sediments. The analogous origin can be ascribed to the Rokietnica elevation which is also infilled with the Cretaceous sediments. Both basin have been definitely formed during the Subhercynnian and Laramian phases. The Poznań—Kalisz dislocation zone is characterized

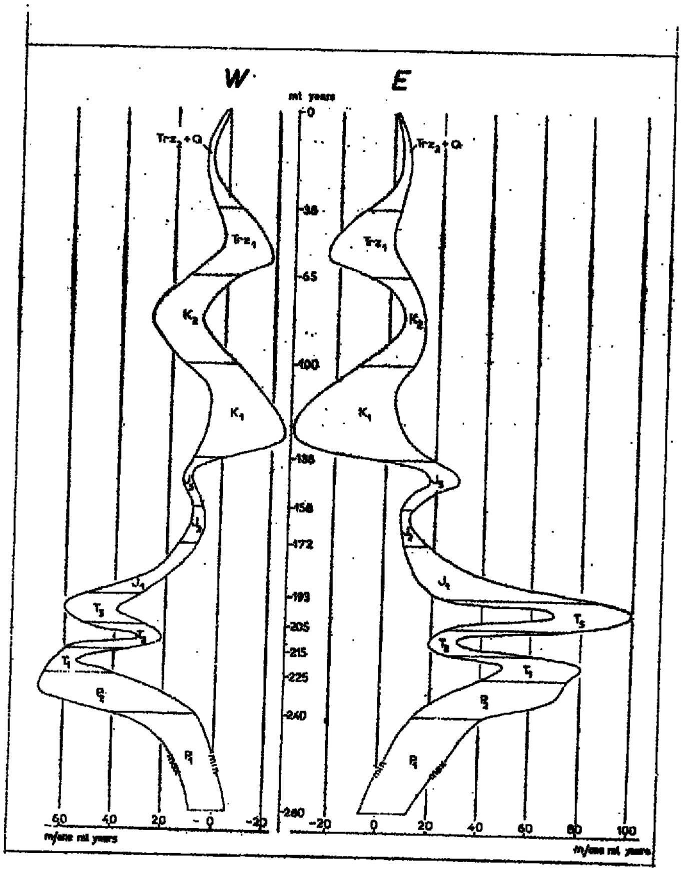

Fig. 15. Diagrams of mean subsidence velocity and erosion in the area of Wielkopolska in the particular epochs

W — area of western Wielkopolska, E — area of eastern Wielkopolska, *max* — maximal subsidence, *min* — minimal subsidence. *Attention:* negative subsidence = erosion. Trz_1 — Palaeogene, Trz_2+Q — Neogene + Quaternary. Other explanations as in Fig. 14

first of all by increased thicknesses of the Upper Triassic and Lower Jurassic formations. It shows the same direction (NW—SE) as the Lwówek and Rokietnica elevations. Hence it can be assumed that despite the differences in reactions of the particular elements at the same time, they are genetically related one to another and their activity has been caused by the same factors. The Poznań—Oleśnica dislocation system the importance of which has been demonstrated on the thickness maps separates all other tectonic structures. The eastern part of the Wolsztyn ridge is even shifted in relation to other tectonic elements and other ones terminate their extent at this dislocation. The Poznań—Oleśnica dislocation zone (system) is a very distinctive element among other structures.

RELATION OF THE DEEP SUBSTRATUM TO THE PALEOTECTONICS OF THE PLATFORM COVER

A dozen or so deep seismic soundings have been done in the area of the Fore-Sudetic monocline in the seventies (Guterch & al. 1975a, b). A part of them runs through the area of Wielkopolska. The present author has analysed all the deep seismic sounding cross-sections aiming at relation of deep fractures with the tectonics of the platform cover. The

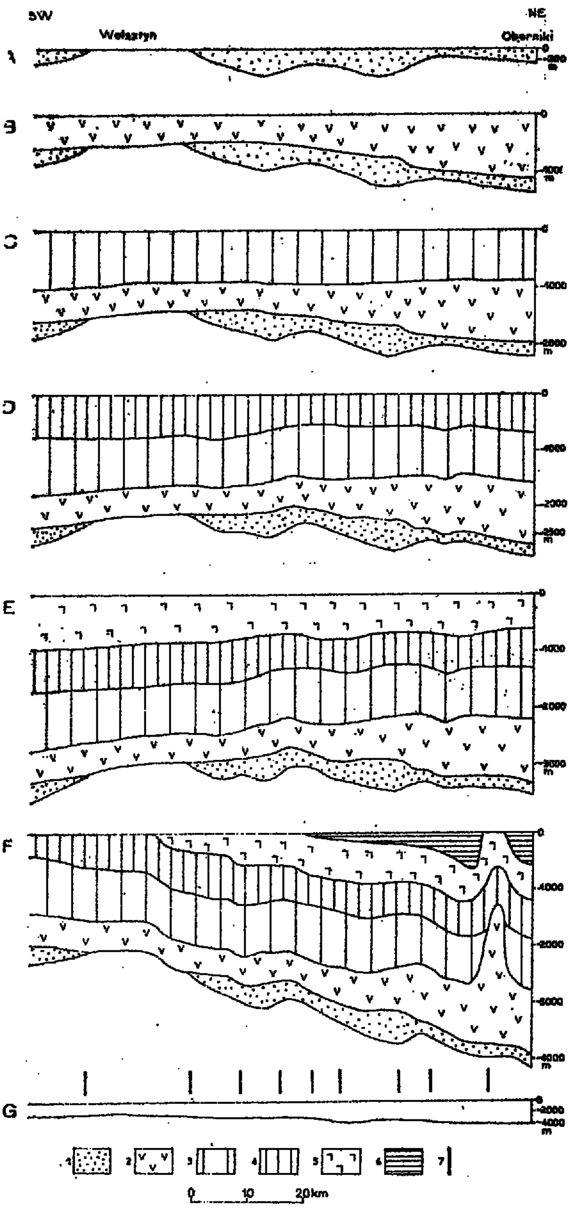

Fig. 16. Palaeotectonic cross-section showing the evolution of the Permian-Mesozoic complex in the area Wolsztyn—Oborniki

A — beginnig of the Zechstein, *B* — beginning of the Triassic, *C* — beginnig of the Keuper, *D* — beginning of the Jurassic, *E* — beginning of the Cretaceous, *F* — beginning of the Tertiary, *G* — thickness of the platform cover without exaggeration

1 — Rotligendes, *2* — Zechstein, *3* — Lower and Middle Traissic, *4* — Upper Triassic (Keuper and Rhaetian), *5* — Jurassic, *6* — Cretaceous, *7* — faults

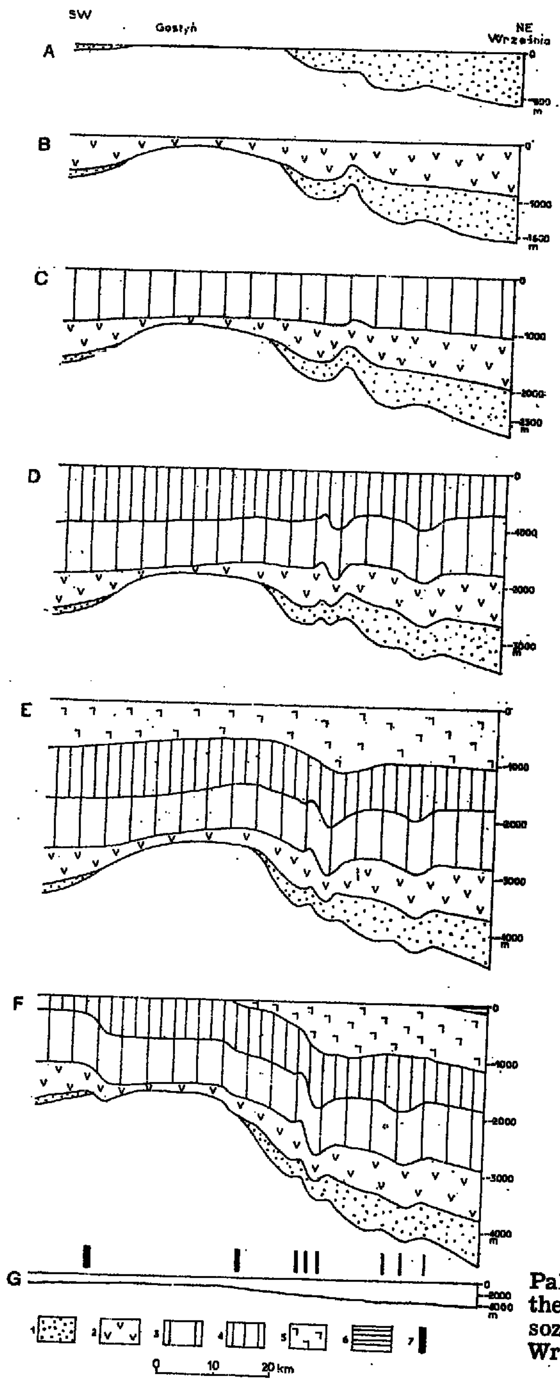

Fig. 17.
Palaeotectonic cross-section showing the evolution of the Permian-Mesozoic complex in the area Gostyń—Września. For explanations see Fig. 16

Dolsk fault described by Pożaryski (1975) runs through the area in question. On all the section it is marked by a distinct differentiation of the Moho discontinuity of about 3 km. The direction of the fault in the Moho is delineated in the area of eastern Wielkopolska by the profiles *M-1, M-9* and *VII* (Guterch & al. 1975b). In not a single profile the fault in Moho does not cross the line of the Warta River and seems to show a directions W—E.

In the western Wielkopolska its direction is WNW—ESE. The course of the Dolsk fault within Moho coincides with the dislocations that border the Wolsztyn ridge from the north. The southern limit of the ridge is cut only by profile *VII* on which in the area of Gostyń (km 130 of the profile) the dislocations within Moho are clearly marked. Interpretation of that point is difficult as there runs also the Poznań—Oleśnica dislocation zone. A small throw in Moho (about 1 km) may designate the southern boundary of the Wolsztyn ridge but it is more probable that the displacement has been caused by the activity of the Poznań—Oleśnica dislocation zone. Within the platform cover the difference in thickness on both sides of that dislocation at that place is about 500 meters whereas the southern boundary of the Wolsztyn ridge is not marked by a distinct thickness difference. Taking into account the dip of the Moho under the Wolsztyn ridge one may assume that its northern side has been more elevated than the southern one and more tectonically active which is proved by the existence of Permian volcanism which is associated with the Dolsk dislocation (Znosko 1979). The Poznań—Oleśnica dislocation system is also documented by the profiles *M-8* and *LT-2* (Guterch & al. 1975b). On both profiles at the crossing point with that dislocation zone deep fractures occur within Moho that did not cause vertical displacements. No major changes in thickness within the platform cover were noted there.

No other fractures are to be observed within the Moho along the deep seismic sounding profiles in the studies area. Thus the Poznań—Kalisz dislocation zone and the Lwówek and Rokietnica elevation have no direct association with the dislocations within the Moho. It may be assumed that the structures of NW—SE direction both within the platform cover and in the substratum of the Permian are associated with the Middle Polish aulacogene. The area in question has been located within the marginal zone of the aulacogene where during the Permian and Mesozoic distension conditions prevailed and favoured the development of normal faults.

The graben systems of Płońsk, Nasielsk and Żuromin (Fig. 18) have been probably formed under such tectonic conditions. Their history can be restored but in outline, nevertheless, it seems to be certain that the grabens have been formed at the Carboniferous-Permian decline and

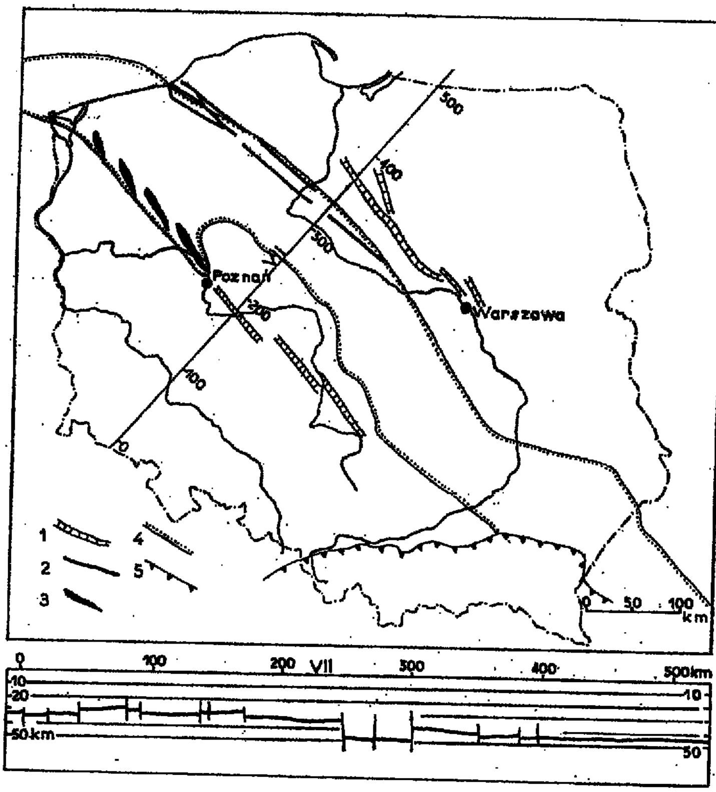

Fig. 18. Distribution of selected genetic types of local structural elements along the marginal zone of the Central Polish aulacogene

1 — grabens, 2 — dislocations, 3 — anticlines, 4 — boundaries of the Central Polish aulacogene after Pożaryski (1975), 5 — margin of the Carpathian overthrust

Below — position of the Moho surface along the profile *VII* (after Guterch & al. 1975a)

continued to developed synsedimentarily up to the Lower Cretaceous (Motyl-Rakowska & Schoeneich 1970). The movements along the planes forming the grabens are still active. The sediments of Upper Cretaceous and Tertiary age that cover them are not disrupted, however. In the Pomeranian synclinorium there are many dislocations running along the Koszalin—Chojnice structure (Fig. 18). They are probably of similar origin. Analogous grabens occur in the western side of the aulacogene. Here the Poznań—Kalisz—Sieradz—Radomsko dislocation zone belongs (Fig. 18). It roughly coincides with the Poznań—Rzeszów lineament distinguished by Pożaryski (1971). In the subcainozoic image the Szamotuły anticline dominates on the western side of the Poznań—Oleśnica dislocation where during the Permian and Mesozoic the structures of Lwówek and Rokietnica were accentuated. Its deeper structure is not well known. Its origin is probably due to squeezing of a tectonically weak zone upward by the Zechstein salts (Fig. 16). Large thickness of the Zechstein sediments in the northwestern Wielkopolska, almost twice as great as within the Poznań—Kalisz zone had greatly contributed to the development of structures associated with salt tectonics.

In result of the Laramian movements the Middle-Polish anticlinorium has been formed in place of the aulacogene. The faults associated with the marginal zone of the aulacogene and with the deep substratum were rejuvenated. The distension conditions that existed within the marginal zone during the development of the aulacogene have reversed to the compression ones at the Cretaceous-Tertiary decline. They caused injections of plastic Upper Triassic sediments and/or the Zechstein salts into zones of tectonic weakness what caused the development of anticlines (e.g. the Szamotuły, Człopa anticline and the anticlines of the Radomsko elevation).

Early Tertiary fault activity is expressed first of all by their influence onto the differentiation of the rate of erosion of the Cainozoic sediments which is proved by the distinct association of the faults with the preserved thickness and recent extent of the Upper Triassic and Lower Jurassic formations (Figs 10, 13, 16—17).

The Poznań—Oleśnica dislocation system that is so distinct in the whole development of the platform cover in Wielkopolska has been active as well in the late Tertiary most probably due to the Neogene tectonic movements causing the formation of the Alpides. During the Miocene grabens have been formed infilled with the brown coal formation along that zone.

CONCLUSIONS

1. The fault network within the platform cover in Wielkopolska has at least Young-Variscan foundations.

2. During the whole development of the platform cover the dislocations bordering the substratum blocks have been rejuvenated many times in result of the phases of the Alpine cycle.

3. The faults bordering the Wolsztyn ridge and the Poznań—Oleśnica dislocation zone are directly connected with the fractures located in the Moho surface. The Poznań—Oleśnica dislocation coincides with the Koszalin—Nysa lineament (Karnkowski 1979).

4. The tectonic structures of NW—SE direction reveal association with the Middle-Polish aulacogene. The area of northern Wielkopolska has been situated within the marginal zone of the aulacogene where distension conditions prevailed that favoured the development of normal faults.

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P. H. KARNKOWSKI

ZARYS TEKTOGENEZY POKRYWY PLATFORMOWEJ W WIELKOPOLSCE

Streszczenie

Na podstawie kilkuset głębokich wierceń z obszaru Wielkopolski (fig. 1) wykonano mapy miąższościowe (fig. 3—13) dla poszczególnych oddziałów lub systemów. Z przeprowadzonej analizy wynika, że na rozwój pokrywy osadowej platformy epiwaryscyjskiej decydujący wpływ miały pionowe ruchy wgłębnych bloków podłoża podpermskiego. Sieć uskoków (fig. 2) na omawianym obszarze ma założenia co najmniej młodowarscyjskie i była wielokrotnie odmładzana w cyklu alpejskim (fig. 14). Uskoki obrzeżające wał wolsztyński oraz strefa dyslokacyjna Poznań — Oleśnica wykazują bezpośredni związek z rozłamami zlokalizowanymi w powierzchni Moho. System dyslokacyjny Poznań—Oleśnica, przebiegający przez centralną część Wielkopolski, uważany dotychczas za strukturę utworzoną w czasie ruchów starokimeryjskich, już we wczesnym permie zaznaczył swą aktywność, co wyraża się zróżnicowaniem średniego tempa subsydencji po obu jego stronach, to jest na obszarze wschodnim i zachodnim (fig. 15). W permie, triasie i jurze obszar wschodni był szybciej pogrążany niż zachodni. Na przełomie jury i kredy nastąpiła inwersja kierunku ruchu elementów tektonicznych (fig. 16—17). Większa prędkość subsydencji na obszarze zachodnim od kredy do dziś doprowadziła do częściowej kompensacji miąższości pokrywy platformowej w stosunku do obszaru wschodniego. Struktury tektoniczne o kierunku NW—SE wykazują związek z aulakogenem środkowopolskim. Ich powstanie wynika z warunków dystensyjnych jakie panowały w strefie marginalnej aulakogenu, co sprzyjało powstawaniu uskoków normalnych. Przykładem struktur związanych z tym mechanizmem są systemy rowów tektonicznych po zachodniej i wschodniej stronie aulakogenu (fig. 18). Po zachodniej stronie dyslokacji Poznań—Oleśnica, gdzie w permie i mezozoiku zaznaczyły się struktury Lwówka i Rokietnicy, w obrazie podkenozoicznym dominuje antyklina Szamotuł. Powstała ona najprawdopodobniej wskutek wypchnięcia przez sole cechsztyńskie strefy tektonicznie osłabionej (fig. 16). Na przełomie kredy i trzeciorzędu, w wyniku ruchów fazy laramijskiej, w miejscu aulakogenu powstało antyklinorium środkowopolskie, a w pokrywie platformowej zaczęły dominować warunki kompresyjne. Były one przyczyną wgniatania się soli cechsztyńskich lub plastycznych utworów górnotriasowych w strefy osłabień tektonicznych, co często powodowało powstawanie antyklin (np. antyklina Szamotuł, Człopy, antykliny elewacji radomszczańskiej). W trzeciorzędzie aktywność uskoków wyraża się przede wszystkim w ich wpływie na zróżnicowanie tempa erozji osadów kenozoicznych, o czym świadczy wyraźny związek dyslokacji z zachowaną miąższością i obecnym zasięgiem utworów triasu i jury (fig. 10, 13, 16—17). Neogeńskie ruchy tektoniczne powodujące powstawanie Alpidów, na obszarze Wielkopolski zaznaczyły się utworzeniem rowu tektonicznego wzdłuż dyslokacji Poznań—Oleśnica, wypełnionego formacją burowęglową. Dyslokacja ta pokrywa się z lineamentem Koszalin—Nysa.