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History of geological development of Lysogirska-Yaroshivska zone

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За результатами вивчення та аналізу карт товщин відкладів 25 комплексів порід Лисогірсько-Ярошівської зони встановлено, що будова її на всіх 25-ти етапах геологічного розвитку була різною. Природні процеси створили 25 своєрідних моделей будови зони через часту зміну знаку тектонічних рухів (інверсію). Особливості палеотектоніки (геодинаміки) вплинули на умови формування пасток для скупчень вуглеводнів.

Ключові слова: палеотектоніка, товщина, відклади, горизонт, підняття, западина, інверсія.

По результатам изучения и анализа карт мощностей отложений 25 комплексов пород Лисогорско-Ярошевской зоны установлено, что строение её на всех 25 этапах геологического развития было разным. Естественные процессы создали 25 своеобразных моделей строения зоны из за частой смены знака тектонических движений (инверсию). Особенности палеотектоники (геодинамики) обусловили формирования ловушек литологического или комбинированного типа для скоплений углеводородов.

Ключевые слова: палеотектоника, мощность, отложения, горизонт, поднятия, впадина, инверсия.

Upon the results of the Lysogirska-Yaroshivska area 25 complexes sediments thickness maps study and analysis it was found that the structure of all these 25 stages of geological development was different. Natural processes created 25 original structure zone models due to the frequent alterations of the tectonic movement directions (inversion). The paleotectonics (geodynamics) specific features affected the conditions for formation of the traps for hydrocarbon accumulations.

Key words: paleotectonics, thickness, sediments, horizon, uplift, depression, basin inversion.

Paleotectonic studies in the former Soviet Union began to be used after the work of V.V. Belousov [1-3], which theoretically described the method of thicknesses.

Concerning the fact what thicknesses shall be taken upon paleotectonic studies generally, V.V. Belousov adhered to the views which he outlined in the book «Basic Issues of Geotectonics» [4]. In particular, he wrote: «... the power method shall be considered as a method of common analysis of fluctuating movements, yielding the average picture of their development vs. the large areas and significant time intervals. This does not mean, however, that the same method cannot be applied to study the local peculiarities of temporary fluctuating movements», and further: «Naturally there is question: what should be the area and stratigraphic interval subject to survey so that the power method yielded the most correct results in upon «automatic» application? This question cannot be answered unambiguously, since everything depends on a specific situation.»

The paleotectonik studies of Lysogirska-Yaroshivska area located in the northwest of the northern by-board area of Dnipro-Donets depression (DDD) were performed first based on the stratigraphic partition of sections of Lysogirska wells 1, 5, 6, 224, 233, 244, 245, St. Sofia 1, 2 4, 5, 6, 7, 8, 10, 13, 15, 50, 51, 52, 53, 63, Yaroshivka 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 31, 32, 33, 34, 35, 36a, 38 bis, 51, 57, Berezhivka 1, 2, 3, 4, 5, 6, 7, 30 and Pivnichnoyaroshivka 1, 2, 3, 4.

In total, 25 maps of isopachyte reflecting the peculiarities of this area development from Tournaisian to Quaternary age.

Tournaisian deposits. The thickness of Tournaisian deposits in the area varied from 35 m in Sofiivska well 8 to 269 m in Lysogirska 233, around which a closed steep negative structural form (depression) was formed, which had an amplitude of 159 m (Fig. 1, *a*). The deposits also extended in the southeast part of the area near Berezhivska well 1 (sediment thickness of 130 m), Yaroshivska wells 8 (162 m), 2 (189 m), 9 (111 m), 3 (124 m). The maximum amplitude of this decrease making nearly 80 m was on the site of Yaroshivska well 2. In the south-western part of the area the closed positive structural form (elevation) was formed in the area of Sofiivska well 8 (amplitude 35 m) and Berezhivska well 6 (amplitude 38 m), but they are much smaller than the depression.

Lower Visean deposits (14th and 13th microfaunistic horizons). The thickness of deposits of the 14th microfaunistic horizon (MFH) varied from 28 m (Lysogirska well 5) to 120 m in Sofiivska well 10 (Fig. 1, *b*). The trend of their distribution is preserved. They varied from 20 m in Sofiivska well 1 to 120 m in Sofiivska well 10. As in the Turnean age, the most sag area has been stretching from the northwest to the southeast from Sofiivska 10 to Yaroshivska well 8. However, in this background there are more small closed positive and negative structural forms. At the place of the cavity at Lysogirska well 233, during the Turnean age there appeared an elevation near Sofiivska well 4, 1, Lysogirska 233 (amplitude 30 m) and a depression at the site of Sofiivska well 10 (amplitude 40 m). The small-amplitude uplifts were formed at Yaroshivska and Pivnichnoyaroshivska areas. Meanwhile there was a rapid increase in the thickness of the horizon

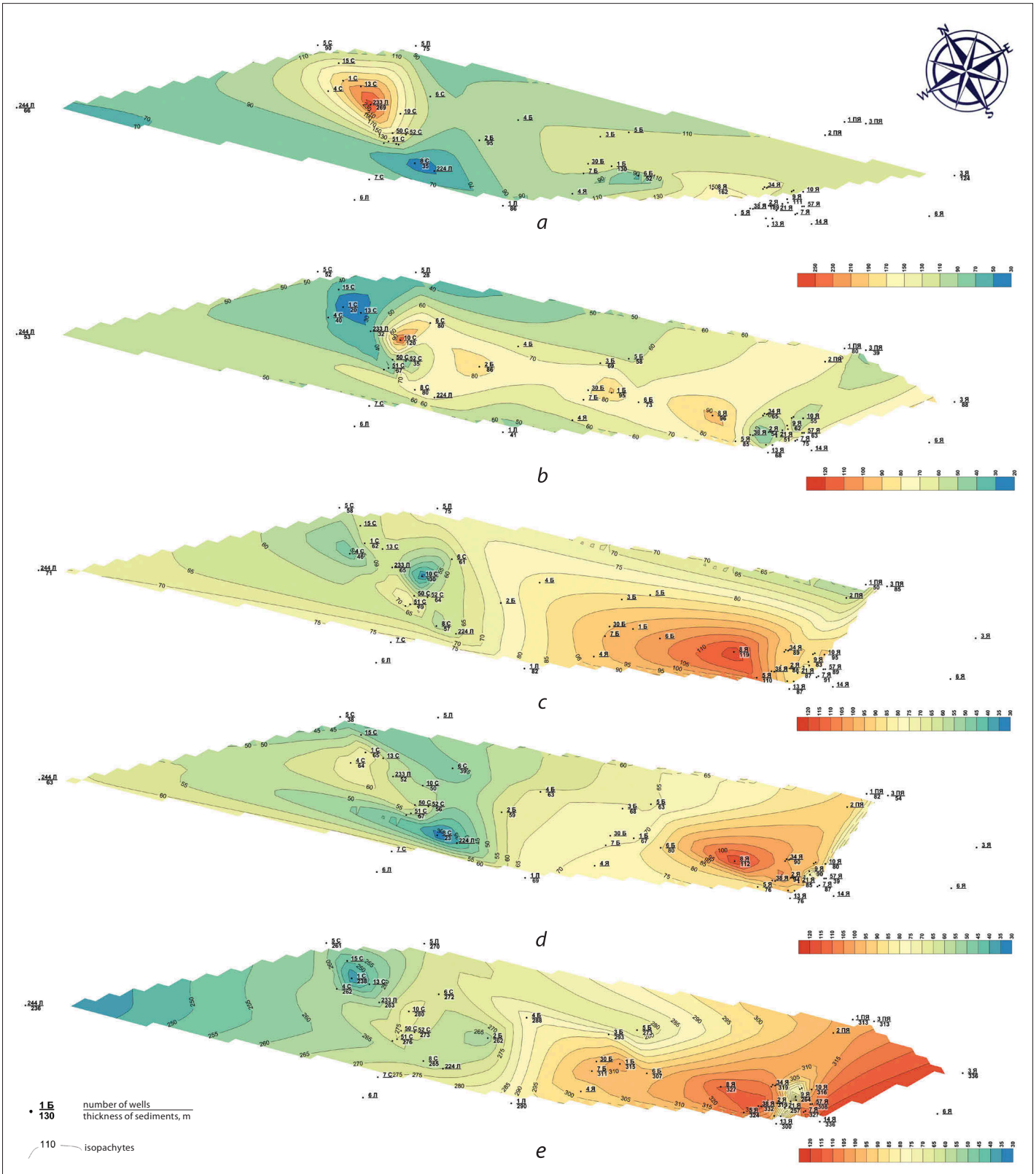

Fig. 1. Isopachyte maps for the sediments of the Lysogirska-Yaroshivska zone: *a* – Tournaisian sediments; *b* – XIV micro-faunistic horizon; *c* – XIII micro-faunistic horizon; *d* – XIIa micro-faunistic horizon; *e* – XI–XII micro-faunistic horizons

between Pivnichnoyaroshivska wells 3 and 1, from 39 to 80 m. The negative closed shapes were formed in the vicinity of Berezhivska well 2, Berezhivska well 1 and Yaroshivska well 8. The amplitude of these basins was 6, 15, 16 m, respectively. The horizon thickness decreased from the submerged part of the area to the south-west and north-east.

During the accumulation of sediments of the 13th MFH, the elevation at the place of Sofiivska well 4 (amplitude 14 m) was preserved, and at the place of depression in the vicinity of Sofiivska well 10 there appeared an uplift, to the southwest of which (a part of Sofiivska well 51) there is a depression (Fig. 1, *c*). Another uplift was formed at the site of Sofiivska well 8. These three uplifts can be considered as a single block, which is delineated with isopachyte 65. To the south-east of it (from Lysogirska wells 5, 1) to Yaroshivska area a steep depression centered in the vicinity of Yaroshivska well 8 and with 40 m amplitude is formed. Consequently, the whole studied area consisted of two nearly equal blocks, i.e. an elevated northwest, where the minimum horizon thickness was 30 m, and the lowered southeast one, the maximum thickness of which reached 119 m.

Upper Visean deposits (HIIa, XII, XI MFH). The structure of HIIa microfaunistic horizon (or its thickness distribution) is generally similar to the structure of XII horizon, but has some differences (Fig. 1, *d*). As before, the whole Lysogirska-Yaroshivska area consisted of two blocks nearly equal in size, the northwestern raised and the southeastern lowered. Still the deepest area was Yaroshivska well 8, in which the horizon was 112 m thick and the depression had a 40 m amplitude. Between Pivnichnoyaroshivska wells 3 and 1, the horizon thickness was changing rapidly, but in the opposite direction compared to the thickness of the XIV horizon.

The peculiarity of the northwestern block structure is a significant extension of the depression, which included, in addition to the area of Sofiivska well 51, also Sofiivska well 4, which was an elevation. The horizon thickness was generally ranging from 23 (Sofiivska well 8) to 112 m (Yaroshivska well 8).

The thickness of XII-XI horizon deposits ranged from 236 m in Lysogirska well 244 and 238 m in Sofiivska well 1 to 336 m in Yaroshivska wells 14 and 3 (Fig. 1, *d*). That is, there was still the growth in thickness from northwest to southeast. Against this backdrop there was a small lift at the site of Sofiivska wells 1, 4 (amplitude 24 m) and Berezhivska wells 2 (amplitude of about 3 m). The negative closed structural shape was formed in the vicinity of Yaroshivska wells 5, 8. It had an amplitude of 12 m. The monoclonal dipping of sediments occurred between Pivnichnoyaroshivska wells 1, 3 (the horizon depth in which is the same) and Yaroshivska wells 14, 3. These the deepest areas were separated by a small elevation.

If we compare the map of XII-XI MFH with the map of HIIa MFH, we'll find significant differences. In the place of the depression in the vicinity of Sofiivska wells 1, 4 and 51 on the map of HIIa horizon in the course of accumulation of sediments of the XII-XI horizon there was formed an elevation, and a small depression appeared at the site of Sofiivska wells 10, 51. In addition, the thicknesses of the XII-XI horizon increased in a monoclonal way from northwest to southeast from the Lysogirska well 244 to Sofiivska well 4, and the distribution of thickness of HIIa horizon in this region is much more complicated.

Serpukhiv deposits. A significant change in the structure of Lysogirska-Yaroshivska zone, or in this case it would be called more accurately Sofiivska-Yaroshivska zone, occurred during the accumulation of deposits of X-IX MFH (Fig. 2, *a*). At this time, two elevations were formed at the site of Berezhivska well 2 with an amplitude of 18 m and at the site of Pivnichnoyaroshivska wells 2, 3 with an amplitude of about 25 m. Between Pivnichnoyaroshivska wells 3 and 1 the horizon thickness was changing rapidly.

The remaining area was submerged, mostly in a monoclonal way. The sediment thickness there varied from 117 to 147 m from the northeast to the southwest.

The map of isopachyte deposits of VIII-V horizons (Fig. 2, *b*) is fundamentally different from the map of isopachyte horizons X-IX. At the place of elevations near Berezhivska well 2 and Pivnichnoyaroshivsks wells 2, 3 there was formed a cavity in which the thickness of deposits reached 110 and 122, 124 m respectively, and in a part of submerged monocline there emerged an elevation with the amplitude about 20 m. It means that the south-western part of the zone rose, and the north-eastern one plunged, which shows the development of inversion processes.

Medium carbon deposits. The distribution of their thicknesses has changed significantly on the map of the lower Bashkir deposits (Fig. 2, *c*). At the site of Lysogirska well 233 and Sofiivska well 51 there was formed a closed negative structure with an amplitude of 10 m. The second depression was formed at the Yaroshivska area. Its amplitude is 15-20 m. Between these depressions there was formed a great uplift with a vaulted in the area of Sofiivska well 3. The difference between thicknesses of sediments in Pivnichnoyaroshivska wells is small, and in the area in general it varied from 52 m in Berezhivska well 3 to 120 m in Yaroshivska well 14.

The thickness of sediments of the upper Bashkir subtier varied from 209 m in Pivnichnoyaroshivska well 2 to 309 m in Yaroshivska well 21 (Fig. 2, *d*). The rocks plunged from the northeast to the southwest. In the north-eastern part of the zone there was formed uplift in the area of Sofiivska well 51, Berezhivska wells 4, 7 and Pivnichnoyaroshivska well 2. The Sofiivska uplifts had an amplitude of 10-15 m and the Pivnichnoyaroshivske uplift is about 30 m. Between Pivnichnoyaroshivsks wells 2, 1 on the one side and well 3 on the other the thickness has been changing rapidly, growing from 209 to 288 m.

In general, the characteristics of thickness distribution of the subtier formations are radically different from the nature of distribution of the lower Bashkir subtier sediments thickness. This difference resulted from inversion proces-ses.

The lower Moscow sediments have the greatest thickness in terms of Lysogirska well 244. To the southeast it decreased to 91 m in Yaroshivska well 2, 99 m in Yaroshivska well 21 and 104 m in Yaroshivska wells 57 and 3 (Fig. 2, *e*).

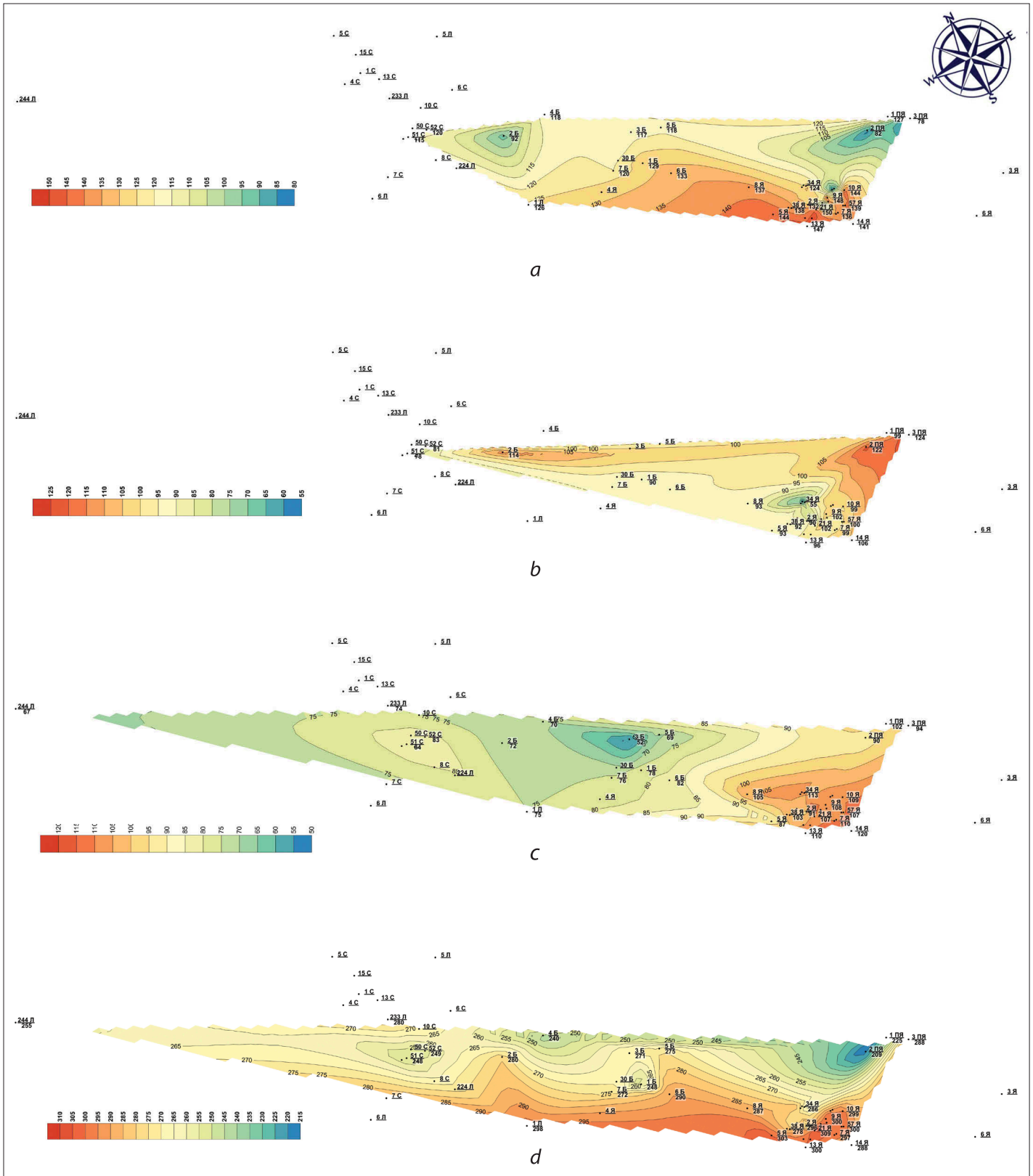

Fig. 2. Isopachyte maps for the sediments of the Lysogirska-Yaroshivska zone: *a* – X–IX micro-faunistic horizon; *b* – VIII–V micro-faunistic horizon; *c* – Lower Bashkirian sediments; *d* – Upper Bashkirian sediments

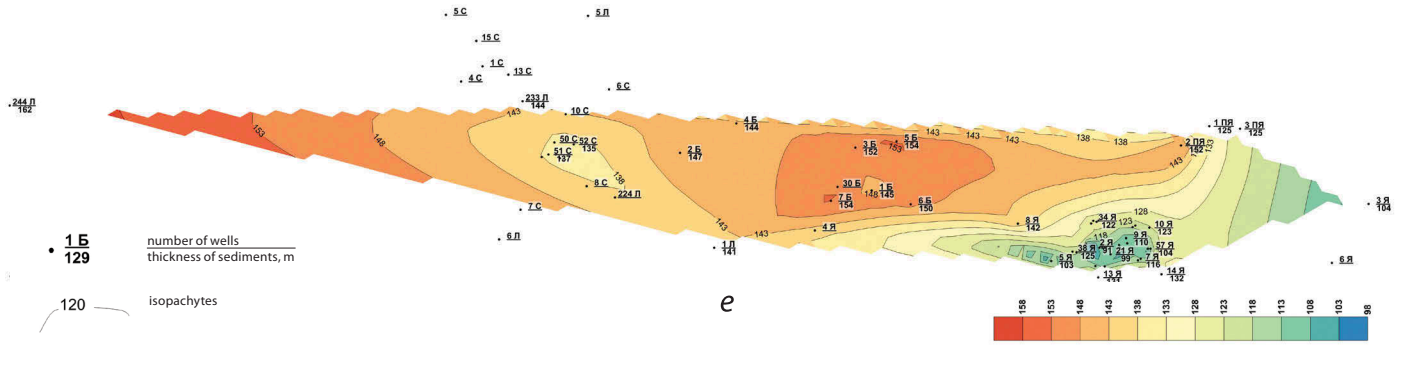

Fig. 2. Isopachyte maps for the sediments of the Lysogirska-Yaroshivska zone: *e* – Lower Moscovian sediments

Against this backdrop there was an elevation at the site of Sofiivska well 51 (10 m amplitude), Yaroshivska well 2 (amplitude of 15 m), Yaroshivska well 21 (7 m amplitude). The cave in the vicinity of Berezhivska well 7, 3, 6, 1 had an amplitude of 5-6 m, and in the Yaroshivska well 27 it was 11 m. It was located between elevations that stretched from north to south and in the latitudinal direction. The elevation in the vicinity of Sofiivska well 51, which was formed in the late Bashkir time, survived, but became larger and changed their orientation. At the place of elevation in the area of Berezhivska wells 4, 7, and Pivnichnoyaroshivska well 2 the huge depression was formed. Instead, the Yaroshivska area rose, which used to be a depression. That is, as in the previous time, the inversion processes actively manifested themselves.

The change in thicknesses of the upper Moscow sediments was radically different from their change in the early Moscow time (Fig. 3, *a*). They had the smallest thickness in the section of Berezhivska well 5 (82 m), and the highest in the context of Yaroshivska wells 3 (212 m) and 14 (211 m). At the place of elevation at the site of Sofiivska well 51, which used to be at the early Moscow time, now a cavity of the same length and with amplitude of 12 m is formed. The steep uplift (amplitude of 55 m) was formed in the vicinity of Berezhivska well 3, 5, 1, which used to be a depression. Yaroshivska area, which used to be elevated, plunged in a monoclonal way. The thickness of deposits on it grew from 174 m in Berezhivska well 7 to 211 m in Yaroshivska well 14 and 212 m in Yaroshivska well 3. Meanwhile the orientation (reach) of structural forms has been preserved completely upon change of the signs of tectonic movements. The thickness of deposits again has changed rapidly at Pivnichnoyaroshivsk area between wells 1 and 2.

The upper carboniferous deposits in Sofiivska-Yaroshivska area have the smallest thickness in Yaroshivska well 10 (257 m), and the highest in Berezhivska well 1 (411 m). Meanwhile from Sofiivska well 51 they increased to the southeast to Berezhivska well 6 and Yaroshivska well 5, and then decreased to Yaroshivska well 10 (Fig. 3, *b*). In general, the area is clearly divided into two almost equal blocks, an immersed northwestern and raised southeastern. The depression at the site of Berezhivska well 1 and 7 was the deepest, and the depression at the site of Berezhivska well 2 had a little less depth. The first of them, with isopachyte 360 m, had amplitude of 51 m, and the second 33 m. The most elevated was Yaroshivska area between 310 and 280 isopachytes. It is limited by narrow bays from the south-west and north-east. There were formed several small closed positive structural forms. It means that Yaroshivska and Pivnichnoyaroshivska areas experienced the rising inversion tectonic movements. In the latter rapidly increased the thickness of sediments from wells 1 to well 3 and especially well 2.

The thicknesses of the lower Permian deposits varied from 239 m in Lysogirska well 244 to 457 m in Yaroshivska well 13. It means that they grew from the northwest to southeast with some features (Fig. 3, *c*), which should include uplift on the site of Berezhivska well 2 and Sofiivska well 4 (with amplitude about 35 m) and a very steep little uplift at the site of Berezhivska wells 7 and 1 (with amplitude of more than 60 m). Previously, there was a depression here. Yaroshivska area submerged (though it was elevated). To the south-east of it the thickness of deposits decreased to 313 m in Yaroshivska well 3 and increased to 435 m in Pivnichnoyaroshivska well 1.

In general, the structure of the area has undergone radical changes vs. its structure at the late carboniferous age.

The map of peresazka thickness isopachytes (Fig. 3, *d*) is important, because this thickness is considered to be a regional caprock (screening layer). Its thickness varied from 47 m in Yaroshivska well 57 to 95 m in Lysogirska well 1 and 86 m in Berezhivska well 5. A piece that stretched from Sofiivska well 51 through Berezhivska well 2, Yaroshivska well 4, Berezhivska well 7 to Yaroshivska well was elevated. Against this background, the depressions at the site of Lysogirska 1, Berezhivska well 3, Pivnichnoyaroshivska wells 2, 3 well formed with amplitudes 4-10 and uplift in the area of Berezhivska well 7, Yaroshivska well 4, and Yaroshivskiy area. The amplitude of uplift is 5 to 10 m.

The features of change in the thickness of peresazka thickness caused structural peculiarities of the area, which is quite different from its structure in the early Permian age.

The sediments of the lower Triassic had a thickness of 350 m in Sofiivska well 51 to 410 m in Berezhivska well 5 (Fig. 3, *e*). A large area in the northeast of the zone, which is limited by

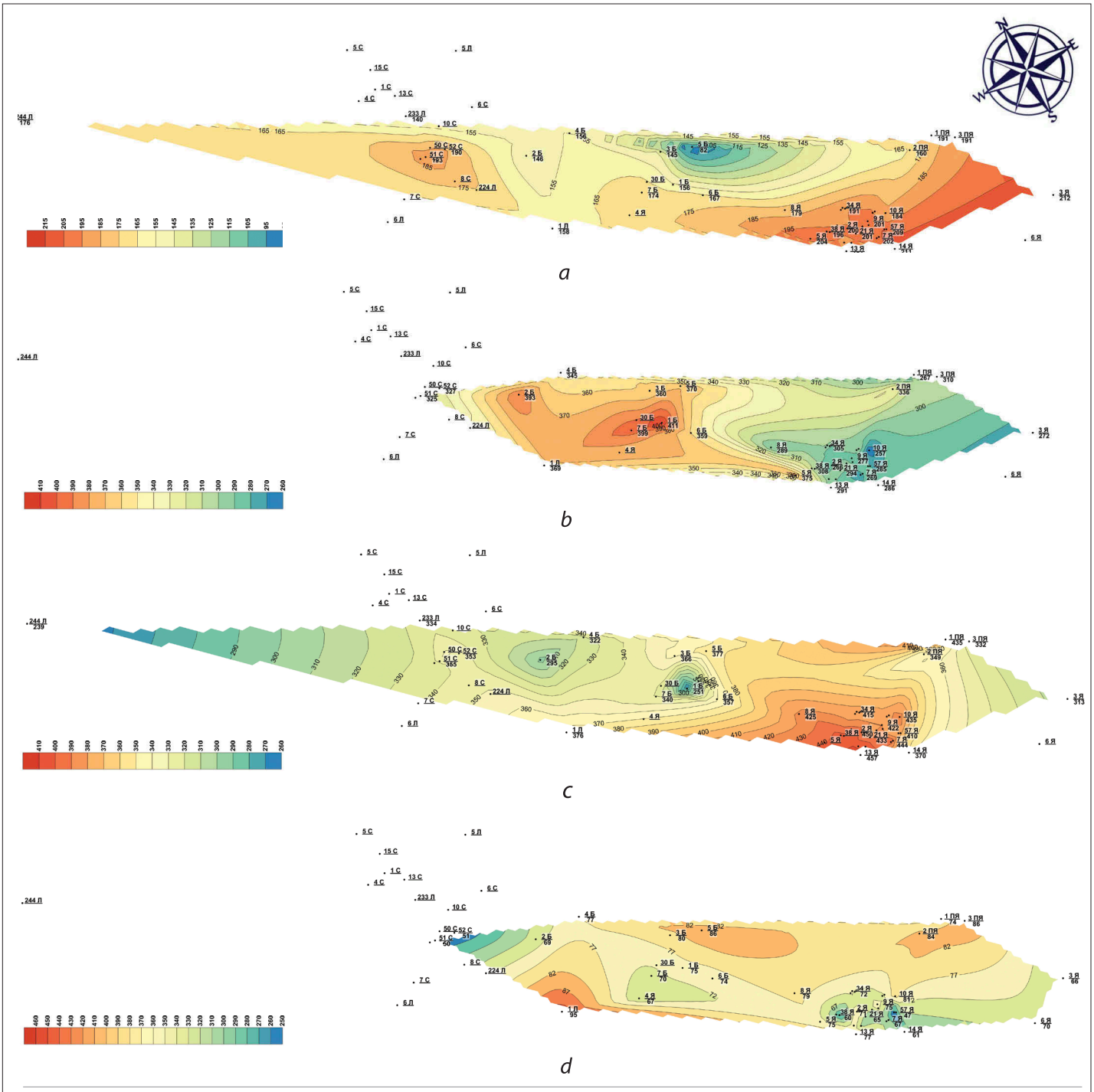

Fig. 3. Isopachyte maps for the sediments of the Lysogirska-Yaroshivska zone: *a* – Upper Moscovian sediments; *b* – Upper Carboniferous sediments; *c* –Lower Permian sediments; *d* – thickness of sediments Peresazka

isopachyte 385 and covered the area of Berezhivska wells 1, 4, 3, 5, 6, Yaroshivska 8, Pivnichnoyaroshivska wells 1, 2, 3, was the deepest at this age. The uplift was formed at the site of Sofiivska well 51, southeast of Lysogirska well 233, and at the site of Berezhivska well 7 and Yaroshivska well 4. The first uplift had amplitude of about 15 m, and the second 5 m. The distribution of thickness of these deposits in much similar to that of the peresazka thickness.

The thickness of the Upper Triassic deposits increased from 299 m in Lysogirska well 244 to 392 m in Berezhivska well 5 and 405 m in Pivnichnoyaroshivska well 1 (Fig. 4, *a*), i.e. from the north-west to the south-east and from the south-

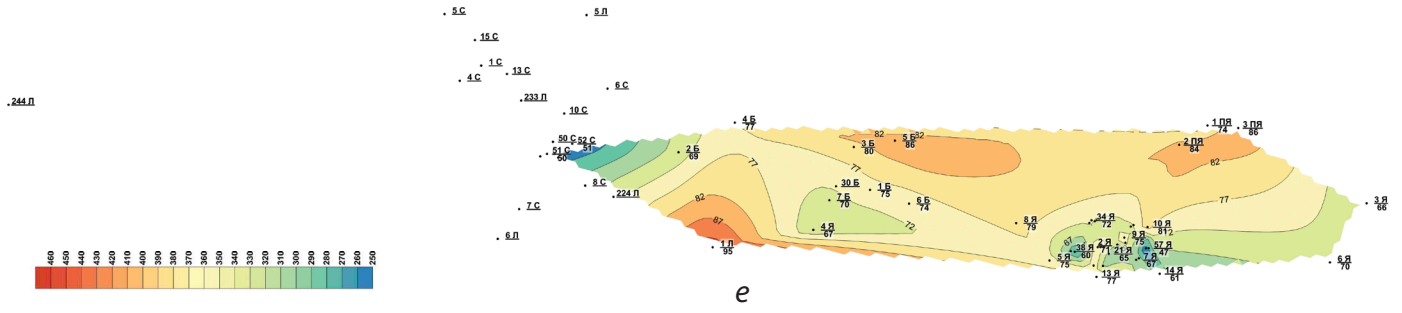

Fig. 3. Isopachyte maps for the sediments of the Lysogirska-Yaroshivska zone: *e* – Lower Triassic sediments

west to the north-east. In the course of accumulation of these deposits no closed structure was formed. The distribution of thickness of the whole complex retained some similarity to the distribution of the thickness of the lower Triassic.

The medium Jurassic deposits had a thickness of 105 m in Yaroshivska well 5 and 118 m in Lysogirska well 244 to 144 m in Yaroshivska well 8 (Fig. 4, *b*). From the northwest to the southeast of the zone the raised and submerged areas or uplift and depression, which had mostly small amplitude, were alternating. At the large area between Lysogirska well 244 and Berezhivska well 2 the difference in the thickness of sediments was only 5 m. At the remaining area there was formed small uplift near Berezhivska well 5 (with 10 m amplitude) and Yaroshivska well 31 (with 25 m amplitude) and depressions in the area of Berezhivska wells 3, 4, 7 (with 9 m amplitude) and in the Yaroshivska wells 8, 5, 14, Berezhivska well 6, and Pivnichnoyaroshivska wells 1, 2, 3 (with 14 m amplitude). That is, the distribution of the thickness of these deposits was significantly different from the distribution of the thickness of the Upper Triassic formations.

The thickness of the Upper Jurassic deposits in Lysogirska-Yaroshivska zone varied from 212 m in Yaroshivska well 57 to 274 m in Berezhivska well 4, 277 m in Berezhivska well 3, 274 m in Berezhivska well 5, 284 m in Pivnichnoyaroshivska well 2 (Fig. 4, *c*) with their growth trend from the southwest to the northeast. The small closed positive structural shapes were formed to south of Lysogirska well 233, near Berezhivska wells 7, 6, 1, Yaroshivska well 4 and at Yaroshivska area. The variation of thickness of the Upper Jurassic deposits is fundamentally different from that of the Middle Jurassic.

The isopachyte map of the Lower Cretaceous deposits (Fig. 4, *d*) is significantly different from isopachyte maps of the Upper Jurassic deposits (Fig. 4, *c*). The thickness of the Lower Cretaceous formations grew from northwest to southeast from 163 m in Lysogirska well 244 to 220 m in Yaroshivska well 13 and 223 m in Pivnichnoyaroshivska well 3. During the accumulation of these deposits there were formed two small closed positive structural forms in the vicinity of Sofiivska well 51 and Yaroshivska well 5. This part of the area was raised, and most of the north-eastern and south-eastern part was immersed. The difference in the thickness of these deposits in terms of Pivnichnoyaroshivska well 2 and 3 reached 26 m.

The thickness of the Upper Cretaceous sediments significantly increased to the southeast from 516 m in Lysogirska well 244 to 571 m in Yaroshivska well 3 and slightly increased to the north-west to south-west (Fig. 4, *e*). In the most south-eastern part the nature of the thickness is opposite to what it was during accumulation of the Lower Cretaceous formations. Small enclosed structural shapes in this age were formed only at Yaroshivska area.

Paleogene deposits. Sumy formation (Lower Paleogene) in Lysogirska-Sofiivska zone had a thickness from 29 m (Lysogirska well 1) to 42 m (Sofiivska well 51) and Yaroshivska area (Fig. 5, *a*). In the process of accumulation of these deposits small inlets in the area of Lysogirska well 245, Berezhivska well 2 (with 8 m amplitude), Berezhivska wells 1, 7, Yaroshivska well 4 (with 7 m amplitude) and Yaroshivska area were formed.

The total thickness of deposits of Kaniv, Kyiv and Buchach formations (middle Paleogene) increased from northwest to southeast from 151 m in Lysogirska well 244 to 177 m in Yaroshivska well 7 (Fig. 5, *b*). Small closed structural forms at this time were formed only in Yaroshivska area. The structure of the rest of the area was complicated with bays and structural noses and was somewhat different from its structure in the past.

The deposits of Kharkiv formations (upper Paleogene) have a thickness of 70 m in Lysogirska well 245 to 77 m in Yaroshivska well 3 and Pivnichnoyaroshivska well 1 (Fig. 5, *c*). From the extreme north-western point (Lysogirska well 244) to the extreme south-eastern point (Yaroshivska well 3) the difference in thickness was 5 m. Against this background, a large central area of the zone Is elevated. It was limited by isopachyte 73 and extended from the northwest to the southeast from Lysogirska well 244 to Yaroshivska wells 5, 13. The small-amplitude uplift in the area of Lysogirska well 245 and Berezhivsks well 2, as well as in the vicinity of Yaroshivska well 4, Berezhivska wells 1 and 6. From this raised area, the deposit thickness increased in all directions. The structure of Lysogirska-Yaroshivska zone area on this map is very different from the structure of the previous time.

In Neogene time the zone structure changed again. Neogene thicknesses are ranging from 42 m at Lysogirska well 244 to 94 m in Lysogirska well 1 and 94, 95, 99 m in Pivnichnoyaroshivska wells 2, 3, 1, respectively (Fig. 5, *d*). Against this background,

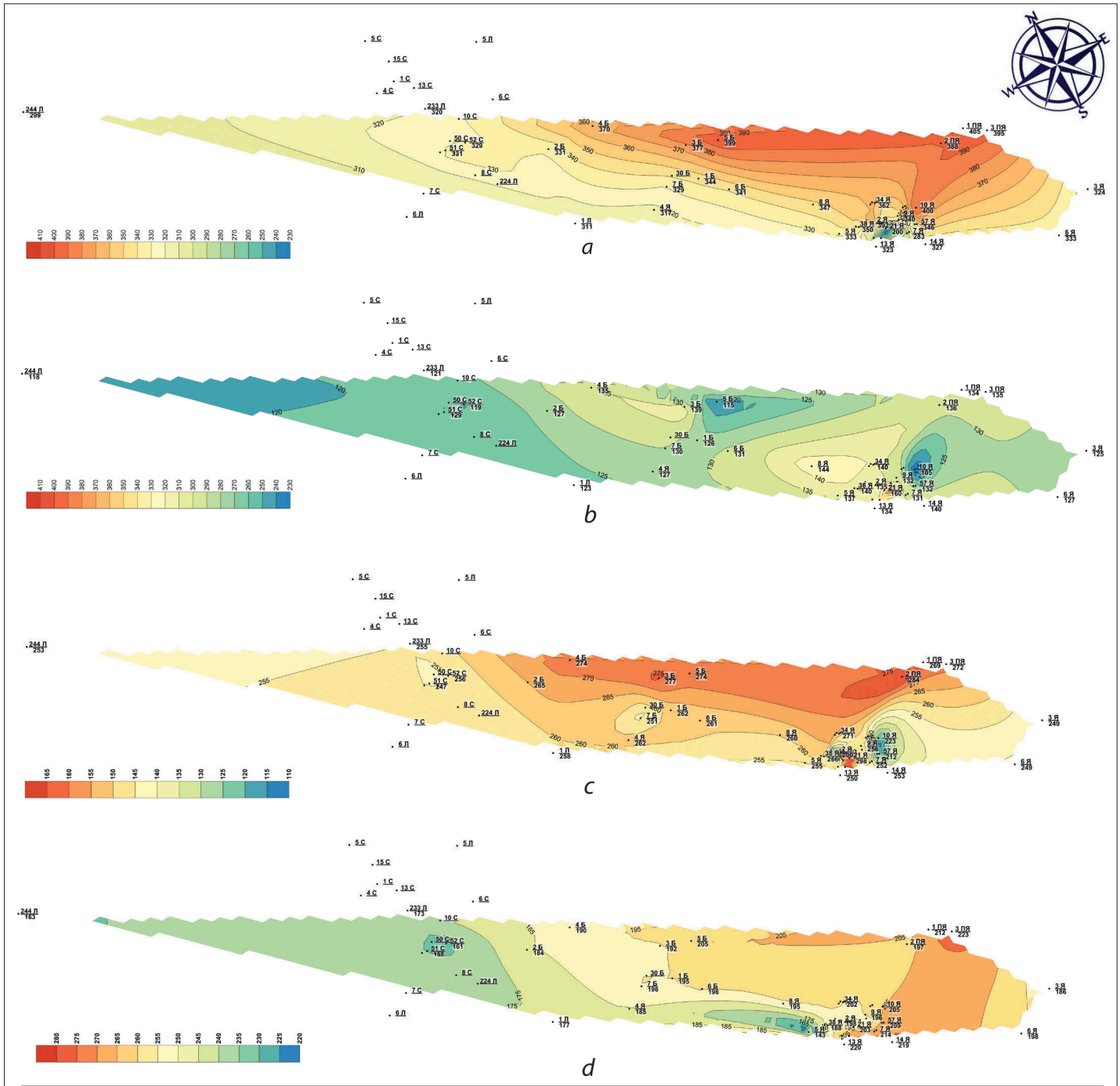

Fig. 4. Isopachyte maps for the sediments of the Lysogirska-Yaroshivska zone: *a* – Upper Triassic sediments; *b* – Middle Jurassic sediments; *c* – Upper Jurassic sediments; *d* – Lower Cretaceous sediments

there is an alternation of raised and submerged areas. The area of Lysogirska wells 244, 233, 245, and the section from Yaroshivska well 4 to Yaroshivska wells 3, 6 was elevated. Among them there was a submerged area, which had greater amplitude. It means that the structure of the area has undergone significant changes in comparison with its structure at Kharkiv time.

The difference in thickness of Quaternary deposits is 38 m. The nature of their distribution in the area is complex (Fig. 5, *e*). It is the smallest in Lysogirska well 1 (26 m), Berezhivska well 3, 5, 1, and Pivnichnoyaroshivska well 1 (27 m), and the largest in Yaroshivska wells 4, 38 (64 m). The elevated areas covered the Lysogirska wells 245 and 1, Berezhivska wells 7, 3, 5, 1, and Pivnichnoyaroshivska wells 2 and 1. They were divided by the submerged area that stretched from Lysogirska well 233 to Berezhivska well 2 and cover almost whole Yaroshivska area. The structure of the whole area again radically changed.

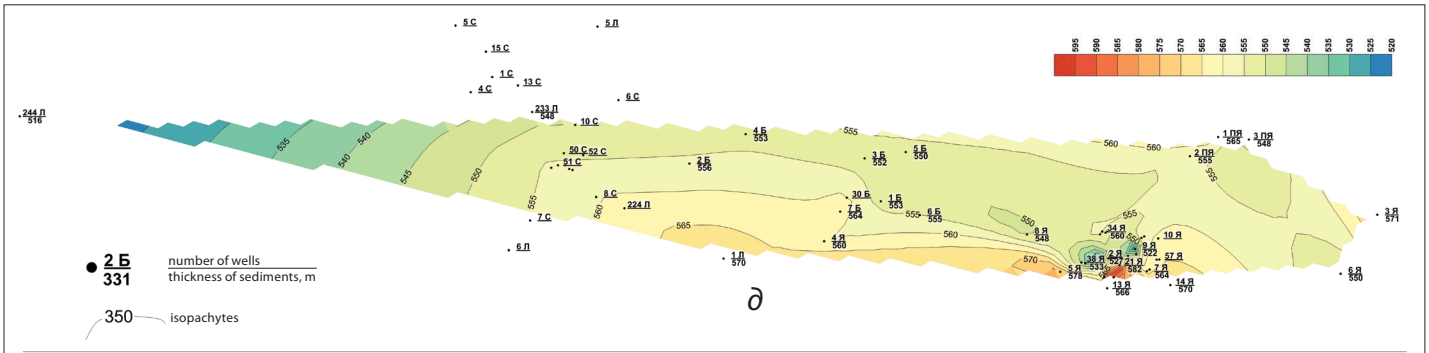

Fig. 4. Isopachyte maps for the sediments of the Lysogirska-Yaroshivska zone: *e* – Upper Cretaceous sediments

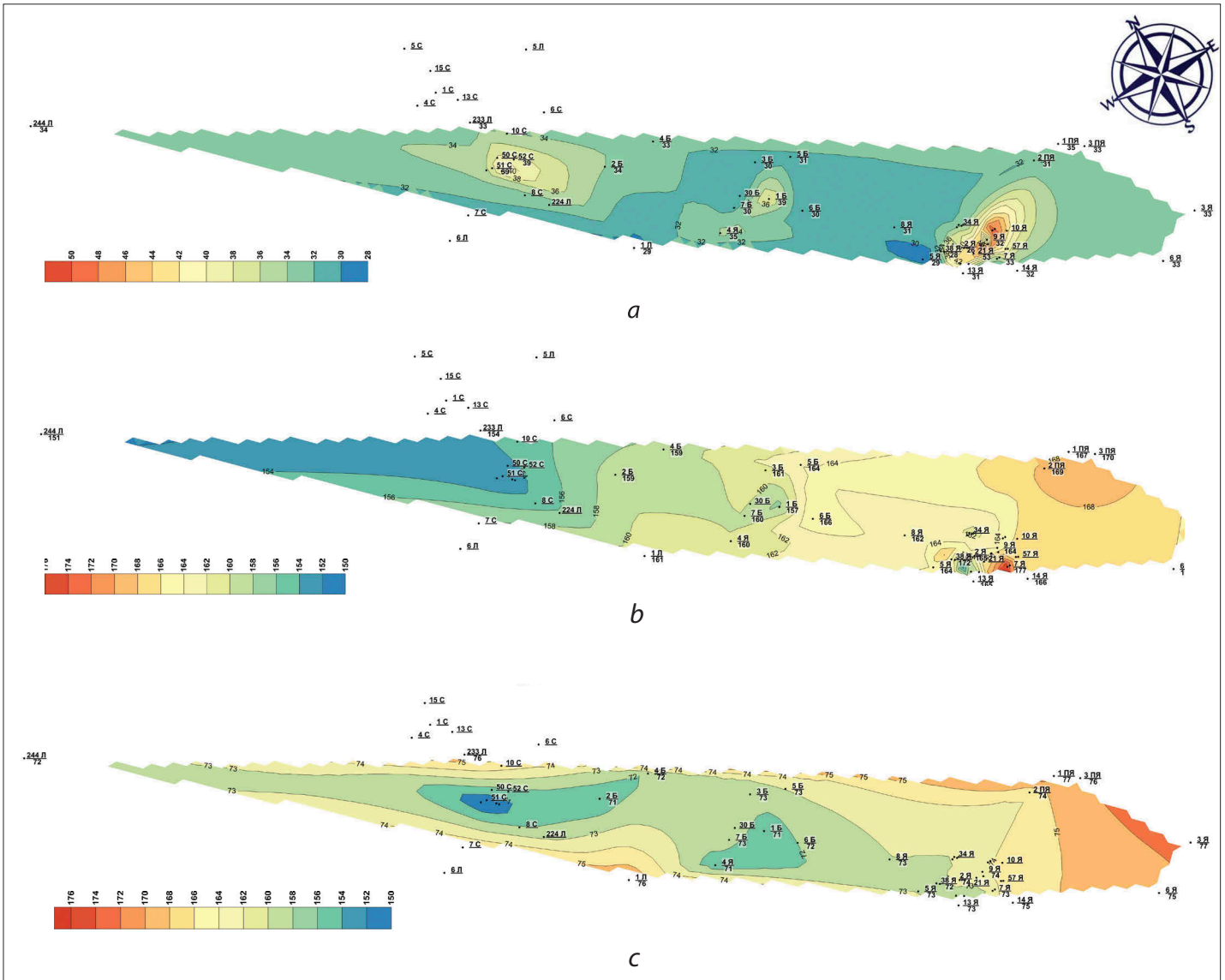

Fig. 5. Isopachyte maps for the sediments of the Lysogirska-Yaroshivska zone: *a* – Sumy suite sediments; *b* – Kaniv suite sediments, Buchak suite sediments, Kyiv suite sediments; *c* – Kharkiv suite sediments

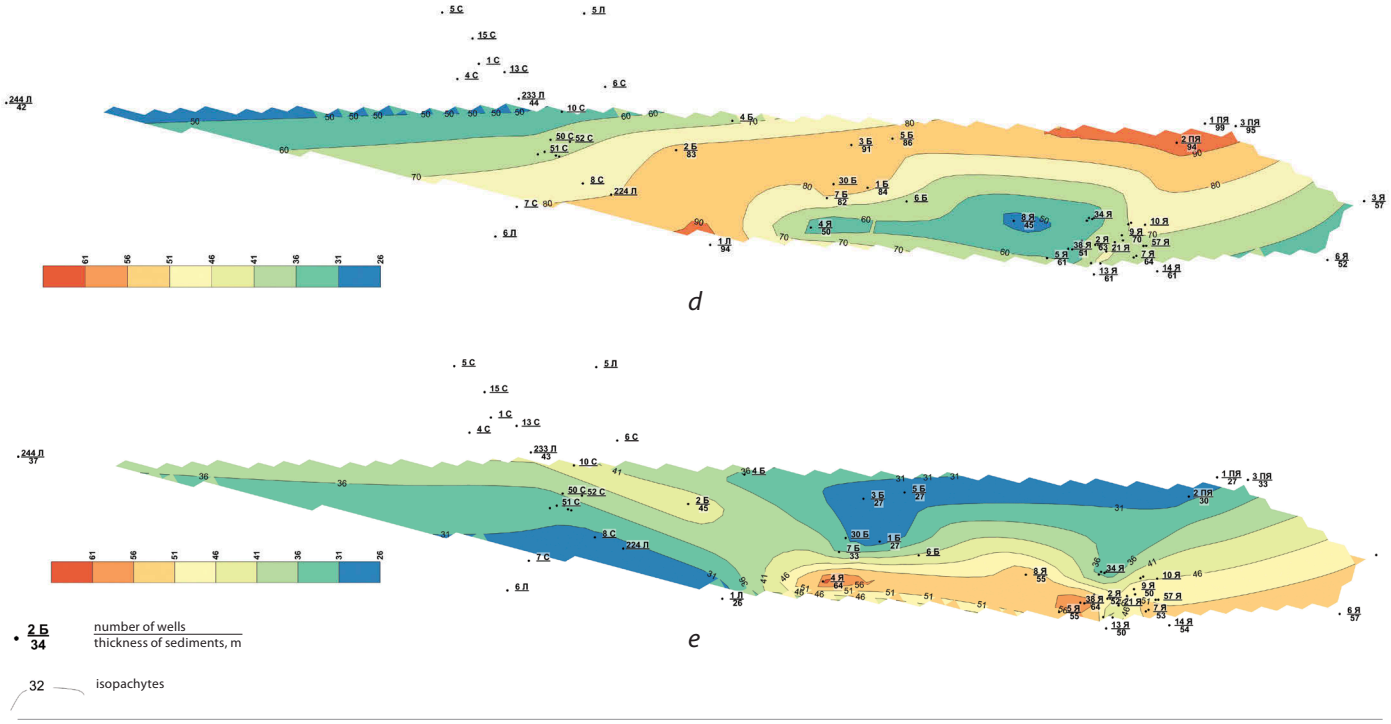

Fig. 5. Isopachyte maps for the sediments of the Lysogirska-Yaroshivska zone: *d* – Neogene sediments; *e* – Quaternary sediments

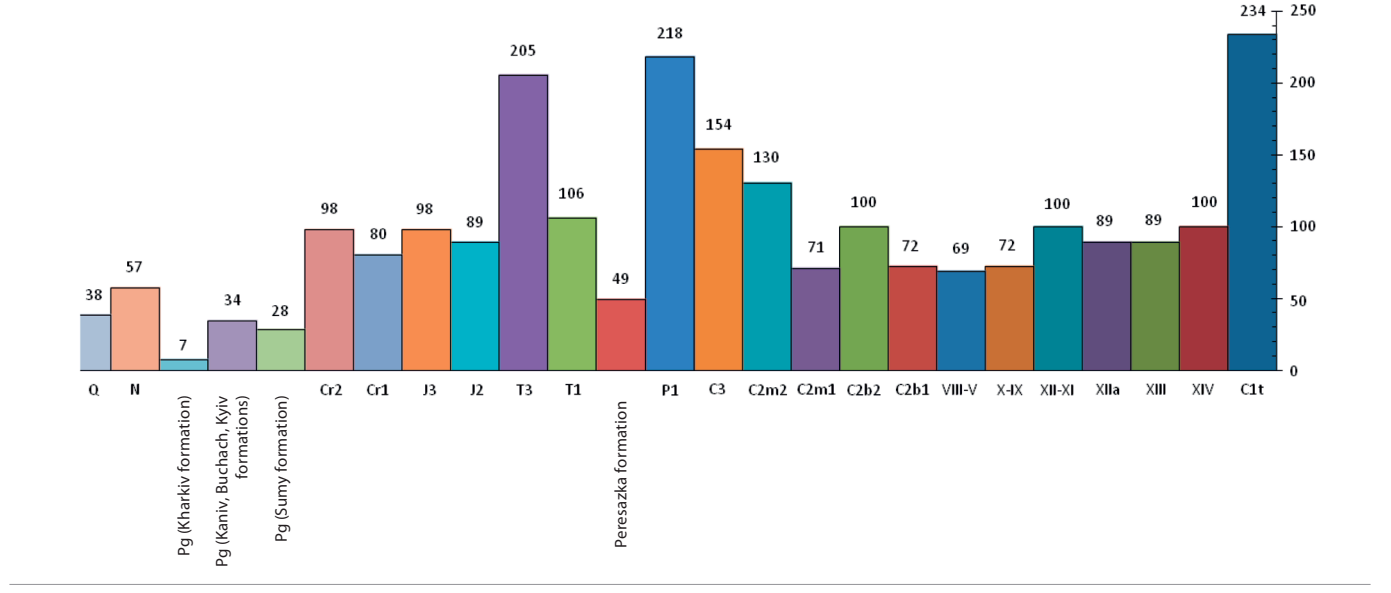

Fig. 6. Comparative graphical presentation of geodynamic process activity in Lysogirska-Yaroshivska area

To better understand the geodynamic processes which occurred in Lysogirska-Yaroshivska area, the difference in thickness of deposits of all 25 complexes studied is provided (Fig. 6).

The difference in thickness of Tournai deposits was 234 m, XIV horizon – 100 m, XII – 89 m, HIIa – 89 m, XII-XI – 100 m, X IX – 72 m, VIII-V – 69 m, lower Bashkir – 72 m , upper Bashkir – 100 m, lower Moscow – 71 m, upper Moscow – 130 m, upper Carboniferous – 154 m, lower Carboniferous – 218 m, peresazka thickness – 49 m, lower Triassic – 106 m, upper Triassic – 205 m, middle Jurassic – 89 m, upper Jurassic – 98 m, lower Cretaceous – 80 m, upper Cretaceous – 98 m, Sumy formation of Paleogene – 28 m, Kaniv, Buchach, Kyiv formations of Paleogene – 34 m, Kharkiv formation of Paleogene – 7 m, Neogene – 57 m, Quaternary – 38 m.

The graphical comparative presentation of activity of tectonic processes in Lysogirska-Yaroshivska zone is given in Fig. 6. It shows that these processes were the most active in the Turnean and Late Triassic age. Its growth began at the late Moscow time and continued in the late Carboniferous. Their activity was much lower, but almost identical, upon accumulation of deposits of XII-XI horizons (Upper Visean), upper Bashkirs, lower Triassic, upper Jurassic and upper Cretaceous. The third by activity are the tectonic processes taking place during accumulation of deposits of XIII MFH, Serpukhov, lower Bashkir, lower Moscow, and Neogene. The active tectonics was the lowest during formation of deposits of Sumy and Kharkiv formations of Paleogene.

Summary

Lysogirska-Yaroshivska area developed rapidly from the Turnean to Quaternary age, as evidenced by 25 created maps of thicknesses of different complexes. The zone structure during 25 stages of its development never repeated. Every time it changed due to the change of signs of tectonic movements.

Tectonic processes generally have fluctuating, stepwise nature, i.e. active periods, ages, times were replaced by the passive ones, or, in other words interspersed. The most passive, in this sense, was the Palaeogene period.

The features of geodynamics at the site of Dnipro-Donets Depression created the conditions for formation of lithologic or combined traps.

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ПРОФЕСІОНАЛИ ГАЛУЗІ

Мелець Михайло Васильович

10 травня цього року перестало битися серце відомого фахівця у сфері газопостачання та газифікації, колишнього головного інженера республіканського об'єднання «Укргаз» Михайла Васильовича Мелеця.

Народився Михайло Мелець 29 вересня 1935 р. у с. Стоділки Городоцького району Львівської області. 1954 р. закінчив Львівський житлово-комунальний технікум, 1965 р. – Київський інженерно-будівельний інститут.

Трудову діяльність у газовій галузі М. В. Мелець розпочав 1956 р., після демобілізації з армії, на посаді газотехнічного інспектора Дніпропетровської області. Брав участь в організації подавання коксового газу Дніпродзержинську та Кривому Рогу. З 1957 до 1980 р. пройшов шлях від інженера мереж газопостачання до начальника обласного управління з газопостачання та газифікації «Дніпрогаз».

Протягом 1980–1996 рр. Михайло Васильович обіймав посади головного інженера республіканського об'єднання «Укргаз», заступника голови правління корпорації «Укргаз». Після виходу на пенсію до 2012 р. працював головним спеціалістом Асоціації підприємств газового господарства України.

Михайло Мелець зробив вагомий внесок у розробку нормативної бази галузі, організацію підготовки кадрів, розвиток соціальної сфери підприємств «Дніпрогаз» та «Укргаз». За його активною участю було здійснено теплопостачання Дніпропетровська з використанням відходів тепла Придніпровської електростанції, налагоджено виробництво поліетиленових труб для систем газопостачання, організовано встановлення будинкових регуляторів тиску газу та розробку на їх основі одноступеневих систем газозабезпечення.

Він приділяв велику увагу захисту газопроводів від корозії, організації налагодження приладового обліку газу населенням і комунально-побутовими споживачами, спорудженню інноваційних виробничих об'єктів, серед яких геотермальні випаровувачі для споживання скрапленого газу. За його участю вперше було створено та введено в експлуатацію оригінальний пристрій із метрологічного забезпечення приладів обліку газу, запроектовано базову автоматизовану систему керування технологічними процесами, запроваджено ультразвукові лічильники у промислових споживачів газу.

Завдяки системному запровадженню згаданих та інших інноваційних розробок стало можливим істотно підвищити рівень безпеки газозабезпечення, збільшити терміни і надійність експлуатації газопроводів.

Михайло Васильович брав участь у ліквідації наслідків аварії на Чорнобильській АЕС. Був депутатом місцевих органів влади.

Є автором 14 винаходів, низки раціоналізаторських пропозицій.

Нагороджений орденами Трудового Червоного Прапора, «Знак Пошани», медалями «За заслуги перед містом Дніпропетровськ», ВЦРПС і ВДНГ. Він – відмінник житлово-комунального господарства, заслужений працівник ЖКГ УРСР.

Висловлюємо щирі співчуття рідним і близьким померлого. Світла пам'ять про нього назавжди залишиться в наших серцях.

Друзі, колеги по роботі,
редакція журналу