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VALUABLE SITES OF THE INANIMATE NATURE IN THE GÓRY SŁONNE LANDSCAPE PARK

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Abstract. The Góry Słonne Landscape Park is situated in the eastern part of the Polish Outer Carpathians. Its area covers about 51,000 ha, mainly within the Skole Unit, and partly within the Silesian and Subsilesian Units. The author has selected for protection 15 documentary sites, occurring within the Park area. Further four sites have been proposed as monuments of the inanimate nature. The areas of crude oil exploitation, existing within the Park, represent also valuable visiting sites of geological heritage.

Key words: geological documentary sites, monuments of the inanimate nature, geological heritage, Outer Carpathians, Góry Słonne Landscape Park.

Abstrakt. Park Krajobrazowy Gór Słonnych usytuowany jest we wschodniej części Karpat zewnętrznych. Zajmuje powierzchnię około 51 tys. ha, głównie na terenie jednostki skolskiej, częściowo podśląskiej i śląskiej. Zaproponowano objęcie ochroną 15 geologicznych stanowisk dokumentacyjnych występujących na terenie Parku. Przedstawiono również cztery kolejne stanowiska geologiczne do ochrony jako pomniki przyrody nieożywionej. Wskazano także na znajdujące się na terenie Parku obszary eksploatacji ropy naftowej, mogące pełnić rolę geologiczno-przemysłowych obiektów dziedzictwa geologicznego.

Słowa kluczowe: geologiczne stanowisko dokumentacyjne, pomnik przyrody nieożywionej, dziedzictwo geologiczne, Karpaty zewnętrzne, Park Krajobrazowy Gór Słonnych.

LOCALISATION AND GEOGRAPHICAL FEATURES

The Góry Słonne Landscape Park is situated in the south-eastern part of the Polish Carpathians. Legally established in 1992, the territory of the Park was extended in 1996 to 51,392 ha. The Park is situated within the Sanok–Turka Mountains and the Przemyśl Foothills. Close to the western border of the Park flows large San River, to the south-west there are larger towns: Sanok, Lesko and Ustrzyki Dolne; while the eastern border runs along the Polish–Ukraine frontier (Fig. 1). In the south-eastern part of the Park lies the continental water divide. Most of the Park territory belongs to the Baltic Sea catchment area, drained by the San River with its tributaries: Wańkówka, Tyrawka, Wiar; the rest of the Park is drained by the Strwiąż with its tributary Stebnik to the Black Sea. In the axial part of the Landscape Park area, there are high ranges, situated in the NW–SE direction: Góry Słonne (Słonne Mts. or Słone Mts. = Salt Mts., with the highest peak 638.6 m a.s.l.), Ostry Dział (721.5 m a.s.l.), Chwaniów (677.1 m a.s.l.), Bukowina (600.2 m a.s.l.) and Czernina (617.5 m a.s.l.). The ranges together with river valleys form a typical crate system, resulting from the tectonical structures of the geological basement (Fig. 2).

On the territory of the Góry Słonne Landscape Park, there exist eight forest and floristic reserves: Chwaniów (354 ha), Na Opalonem (216.5 ha), Polanki (192 ha), Dyrbek (130 ha), Buczyna w Wańkowej, Nad Trzciańcem and Na Oratyku, all of them representing the natural Carpathian forest with the woods

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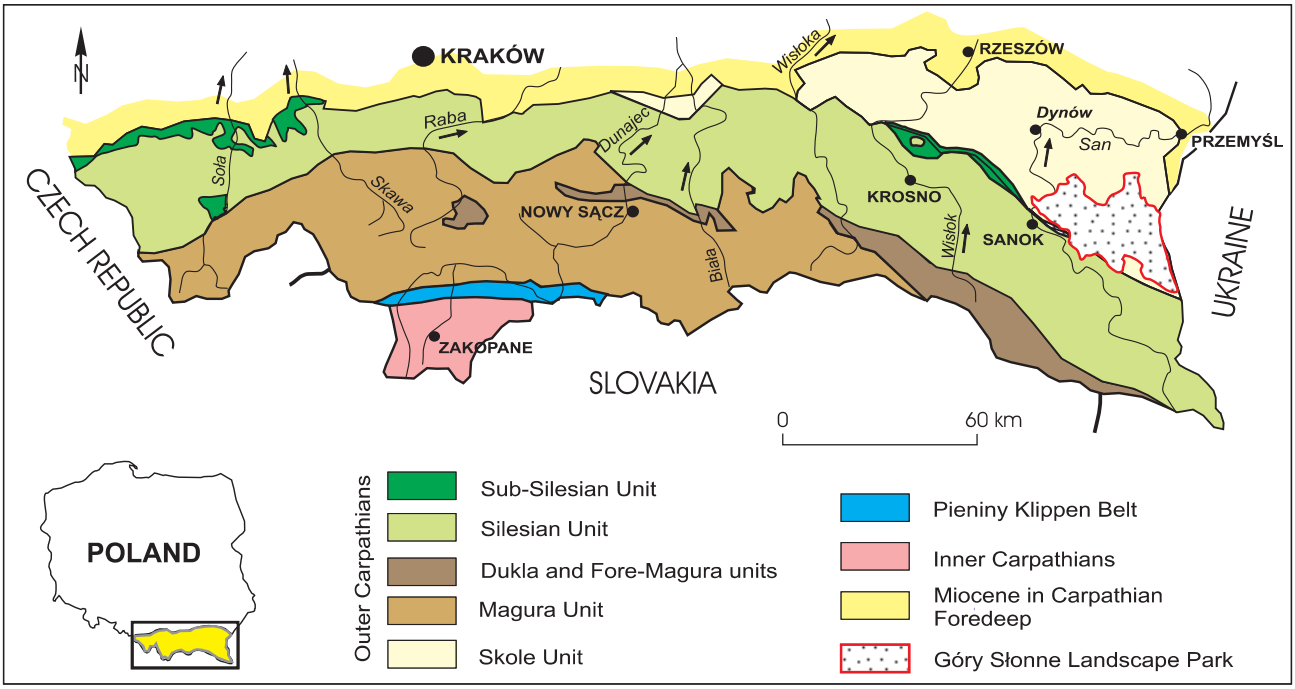

Fig. 1. Localisation of the Góry Słonne Landscape Park against the background of the geological structure of the Carpathians

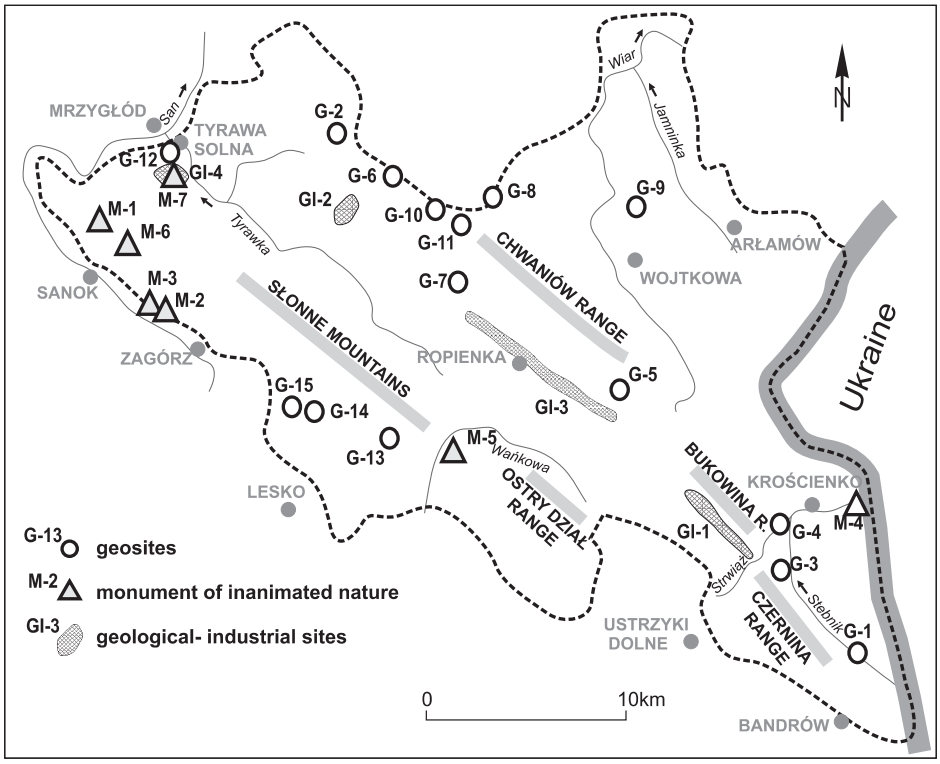

Fig. 2. The Góry Słonne Landscape Park with the localisation of the proposed for protection documentary sites, monuments of the inanimate nature and geological-industrial sites against the background of morphological structures and drainage pattern

of the sub-alpine type, and Góra Sobień enclosing castle remnants and a unique site with xerothermic plants (5.3 ha). The Park area, together with some regions situated farther to the North, was to form the Turnica National Park, but the project was abandoned at the stage of final planning (Michalik *et al.*, 1993). Within the Park area there existed a government recreational centre near the village of Arłamów, shut down several years ago.

GEOLOGICAL SETTING

The territory of the Góry Słonne Landscape Park belongs mainly to the Skole Unit, and only its fragments to the Subsilesian and Silesian Units of the Outer Flysh Carpathians (Fig. 1) (Sikora, Żytko, 1961; Kotlarczyk, 1978, 1988). All these Units are developed as overthrust folds with the general NW–SE strike and dominant NE vergence (Gucik, Wójcik, 1982; Gucik *et al*., 1991; Wdowiarz, 1961). Deformations of the Outer Carpathians orogen took place during the several phases of the Alpine orogeny, and the final development was reached during its Late Styrian phase.

The Subsilesian and Silesian Units are well defined along the thrust planes in the SW side of the Park. Towards SE, starting from Zagórze, they amalgamate with the Skole Unit (Koszarski, Szymakowska, 1961; Koszarski, 1961; Żytko, Zimnal, 1997) (Fig. 2). The internal geological structure of the Park area has been recognised in two deep boreholes: Brzegi Dolne IG 1 and Jasień IG 1, situated near Ustrzyki Dolne.

Within the Skole Unit, three overthrust folds of the first order, i.e. Paraszka, Zełemianka and Rożanka, were distinguished. These folds enclose a number of minor fold structures, anticlines and synclines, with different degree of overthrusting. After amalgamating, the Subsilesian and Silesian Units extend to the SE as the Ustianowa–Rabe–Żłobek fold. Within this fold, there are secondary structures, including the Żukowa saddle filled with the Krosno Fm. strata; most of this saddle lies outside the Park limits.

DOCUMENTARY SITES

Within the Góry Słonne Landscape Park, there are several stratotype, hypostratotype and other geological profiles of the formations belonging to the Skole Unit. Some interesting outcrops are also situated within the Subsilesian and Silesian Units (Tokarski *et al*., 1961).

SKOLE UNIT

The strata of the Skole Unit were formed between the Hoteryvian and Burdigalian (inclusive), i.e. from the Lower Cretaceous to Lower Miocene. Their total thickness exceeds 4.5 km. They were subdivided into a number of geological formations, and these in turn into lower Units of members and beds ranks. Going from the oldest to the youngest strata, the Skole Unit encloses the following formations and complexes: the Spas Fm., Dołhe Fm., Ropianka Fm., Węglówka Marl Fm., Variegated Shale Fm., Hieroglyphic Fm., Menilite Fm., and Krosno Fm. 12 profiles have been selected inside them for protection as geological reference sites. Their strata belong to the Węglówka Marl Fm., the Variegated Shale Fm., the Hieroglyphic Fm. and the Menilite Fm. (Rajchel J., 1990; Bilan, 2001).

The Węglówka Marl Fm. represents a section of the profile from the upper part of the Lower Cretaceous to Eocene. In the Skole Unit, these marls occur in the south-eastern part of the Unit as minor intercalations within the uppermost part of the Ropianka Fm., and at the bottom of the Variegated Shale Fm. within a more narrow time range than they do in the Silesian and Subsilesian Units. They are developed as red, pink and grey-green marls and calcareous shales.

The Tertiary Variegated Shale Fm. has a thickness of up to about 150 m, and spans the age Upper Palaeocene–Lower Eocene. It is a complex of red and green shales with the characteristic Trójca Red Shale Mb. that contains clinoptilolite, a valuable mineral of the zeolite group, and manganese microconcretions (Wieser, 1982, 1994). This formation contains also very rich and best preserved assemblages of Radiolarian microfauna (Bąk *et al*., 1997; Morgiel, Szymakowska, 1978; Rajchel J. *et al*., 2000b). There are also deposits of cohesive clay flows in the form of lithosoms of sandstones as well as lenses of Babica clays with numerous exotic rocks, and the correlation horizon of the organodetritic Bircza *Lithothamnium* Limestone Bed (Rajchel J., 1994, 1990; Rajchel, Myszkowska 1998a, b). Manganese, calcium, magnesium and iron concretions are the additional features of the Variegated Shale Fm.

The Hieroglyphic Fm., with a thickness of about 200 m, covers the age from the Lower Eocene to the lowermost Oligocene. The dominant sediment of this formation is represented by a fine-bedded flysch with a characteristic green colour, distinguished as the Bachórz Shale-Sandstone Mb., with the Jureczkowa Variegated Shale Bed and the Wojtkowa Glauconite Sandstone Bed. Other members: the Widaczów Green Shale Mb. and the Nienadowa Marl Mb. (Rajchel, Uchman, 1998) are developed at the bottom of the formation, while the Skopów Green Shale Mb. and the Bartkówka Calcareous Sandstone Mb. — at the top of the formation. In the upper, north-eastern part of this formation, there are deposits of enor-

mous olistostrome, named the Popiele Mb. In the south-western part, there occur thick-bedded lithosoms of calcareous sandstones (the Chwaniów calcareous sandstones) as well as lensoidal lithosoms of the Czudec clays. The most characteristic deposit of the Hieroglyphic Fm. is represented by the Strwiąż Globigerina Marl Mb. at the top of the formation; it marks the Eocene/Oligocene border, and constitutes a correlation horizon within the whole Carpathian arc.

The Menilite Fm. is up to 400 m thick, represents Oligocene, and is developed as non-flysch, brownish siliceous-clayey shales with intercalations of sandstone lithosoms. In the lower part, there is a characteristic, brownish Kotów Menilite Chert Mb. and the Dynów Marl as well as the horizon of the Futoma Diatomites. The contact of the Menilite Fm. with the overlaying Krosno Fm. is characteristically diachronic. One of the signs of this diachronics can be seen in the monochronic horizon of the Jasło Shales.

The profiles proposed as the documentary sites (Fig. 2) occur in the following localities:

G-1. Bandrów. Exposed in the Królówka Stream in the lower part of the village, between two bridges, about 150 m upstream of the lower bridge. It represents outcrops of the Hieroglyphic Fm., the Variegated Shale Fm., the Węglówka Marl Fm. and cherts of the Menilite Fm.; it is occurring in the southern limb of the Łodyna Wieś anticline.

G-2. Kreców. Exposed in a stream near Borysów hamlet. It represents outcrops of the Hieroglyphic Fm.; occurring within the Chwaniów anticline.

G-3. Krościenko. Exposed in the bed of the Strwiąż River, about 200 m upstream of the railway overpass above the Ustrzyki Dolne–Krościenko road, near anti-tank barriers from the Second World War. It represents outcrops of the Hieroglyphic Fm.: the Skopów Green Shale Mb., the Bartkówka Calcareous Sandstone Mb., the Strwiąż Globigerina Marl Mb.; and the Menilite Fm.: the Kotów Chert Mb. and Dynów Marl Mb. It occurs in the southern limb of the Kiczera anticline.

G-4. Krościenko. Exposed in the valley of the Strwiąż River about 1.4 km downstream of Krościenko. Situated in the river bed about 200 m upstream of the bridge. It represents outcrops of the Hieroglyphic Fm.: the Wojtkowa Glauconite Sandstone Bed (hipostratotypic profile), the Bachórz Shale-Sandstone Mb., the Bartkówka Calcareous Sandstone Mb. and the Strwiąż Globigerina Marl Mb. This documentary site occurs in the southern limb of the Klewa anticline.

G-5. Ropienka. An exposure in the valley of a stream flowing through the forest towards Leszczowate, in the south-eastern part of the village, near the elevation of Góry Truszowskie. It represents outcrops of the Variegated Shale Fm., the Hieroglyphic Fm.: the Nienadowa Marl Mb., the Bachórz Shale-Sandstone Mb. and the Jureczkowa Variegated Shale Bed within the hypostratotypic area of the Hieroglyphic Fm.; and the chert and marl complex of the Menilite Fm. This site occurs within the southern limb of the Chwaniów anticline.

G-6. Rozpucie. An exposure in a right-side small stream flowing from the Chwaniów ridge to south-western of the Góra Margiel hill. It represents outcrops of Hieroglyphic Fm.: Czudec clays within the Chwaniów calcareous sandstones and the chert complex of the Menilite Fm.; occurring within the southern limb of the Rozpucie–Ropienka anticline.

G-7. Stańkowa. An exposure in the valley of a stream, with its mouth on the eastern side of the Tarnawska Góra, flowing in the forest. It represents outcrops of the Hieroglyphic Fm.: the Strwiąż Globigerina Marl Mb., the Bartkówka Calcareous Sandstone Mb. and the Chwaniów calcareous sandstones as well as of the Menilite Fm.: the chert-marly complex. This profile occurs within the southern limb of the Rozpucie anticline.

G-8. Trzcianiec. An exposure in the stream flowing from the Chwaniów ridge, opposite a former army-managed farm. It represents outcrops of the Hieroglyphic Fm.: the Bartkówka Calcareous Sandstone Mb. and the Strwiąż Globigerina Marl Mb. as well as of the Menilite Fm.: the chert complex; occurring within the southern limb of the Chwaniów anticline.

G-9. Wojtkowa. An exposure in the stream flowing opposite the church, in a distance of about 0.5 km of the road. It represents outcrops of the Hieroglyphic Fm.: the Wojtkowa Glauconite Sandstone Bed within the Bachórz Shale-Sandstone Mb. (belonging to the hypostratotypic profile) as well as of the Menilite Fm.: the subchert strata and the chert-marly complex. This site occurs within the southern limb of the Klewa anticline.

G-10. Zawadka. An exposure localised in the lower part of the village going towards Rozpucie, in a stream near the Borsukowce hill. It represents outcrops of the Hieroglyphic Fm.: the Nienadowa Marl Mb. and the Czudec clays within the Chwaniów calcareous sandstones as well as of the Menilite Fm.: the chert-marly complex; occurring within the southern limb of the Chwaniów anticline.

G-11. Zawadka. An exposure localised in the stream flowing in the upper part of the village near an old cemetery, to south-eastern of Łysa Góra. It represents outcrops of the Hieroglyphic Fm.: the Chwaniów calcareous sandstones, the Bartkówka Calcareous Sandstone Mb. and the Strwiąż Globigerina Marl Mb.; occurring within the southern limb of the Chwaniów anticline.

G-12. Tyrawa Solna. An exposure in a small stream flowing from the south, opposite the church and another one in a field track parallel to the stream mentioned and E of it, situated in a distance of about 1 km of the main road in Tyrawa. It represents an outcrop of strongly deformed rocks of the Variegated Shale Fm. containing manganese (with admixtures of Ca, Mg and Fe) concretions, situated in the place of old digging works. This site occurs within the axial part of the Tyrawa Solna anticline.

SILESIAN AND SUBSILESIAN UNITS

The strata of the Silesian and Subsilesian Units are situated as a narrow range of outcrops in the south-western part of the Góry Słonne Landscape Park. They are represented by the strata spanning the age from Lower Cretaceous to Lower Miocene. Towards NE they are partly separated from the Skole Unit by a thrust surface. The differences between the Silesian

and Subsilesian Units can be traced along a similar thrust surface: it strikes from the western border of the Park towards SE to Zagórze; further to SE the thrust probably disappears.

Going up in the profile, towards the youngest strata the Silesian and Subsilesian Units, the following complexes of the strata have been distinguished: the Grodziszcze Beds, the Vežovice Beds, the Lgota Beds, the green radiolarian shales, the Godula Beds (variegated shales), the Węglówka Marl Fm., the variegated shales, and the Hieroglyphic, Menilite and Krosno formations. Within the Subsilesian and Silesian Units, three sites have been selected for protection as documentary sites. They represent the Węglówka Marl Fm. and the variegated shales as well as the Menilite Fm.

The Węglówka Marl Fm. spans a part of the profile from the upper part of the Upper Creatceous to Eocene. Thickness of this formation ranges from about 60 m in the Silesian Unit to more than 200 m in the Subsilesian Unit. These marls are developed as red, pink, grey-green, green and almost white calcareous shales and marls, with local phosphate and pyrite concretions, and accumulations of native copper and other copper minerals (Ostrowicki, 1958; Gruszczyk, Ostrowicki, 1961; Gruszczyk, 1958; Kita, Ostrowicki, 1959; Franus, Rajchel, 1999). The variegated shales are sediments about several tens of metres thick, with a diversified age in the two units ranging from Palaeocene, and even Maastrichtian, to Lower Eocene. They are developed usually as soft shales with intercalations of green shales, containing manganese and phosphate concretions and subordinate sandstone layers. The Menilite Fm. belongs to Oligocene; its thickness is about 100 m. The formation represents a lithologically diversified complex, with brownish siliceous-clayey shales as a dominant sediment. In their lower part, there are lensoidal insets of sandstones, in the upper part a series of brownish cherts and silicified marls, while in the remaining, essential part, thin intercalations of black shales, cherts and sandstones appear. The upper border of the Menilite Fm. with the Krosno Fm. is diachronic.

Fig. 3. The outcrop of the Menilite Fm. the Adyszów Stream, Monasterzec

The profiles selected for documentary sites (Fig. 2) have the following location:

G-13. Bezmiechowa Górna. In the upper part of the Dyrbek Stream near an old farm. It represents an accumulation of phosphate concretions with copper mineralisation within the Węglówka Marl Fm. and the variegated shales of the Silesian Unit.

G-14. Monasterzec. The profile is about 1 km long, in the Adyszów Stream, beginning from the bridge in the lower part of the village. It represents a number of large outcrops of the Menilite Fm. (Fig. 3) with chert-marly complex and of the Węglówka Marl Fm. with phosphate concretions within the Silesian Unit.

G-15. Monasterzec. In the valley banks of the Adyszów Stream, in the upper, i.e. southern part of the village. It represents the Węglówka Marl Fm. and the variegated shales with native copper and copper minerals. Occurs within the Grabownica anticline.

MONUMENTS OF INANIMATE NATURE

Within the Góry Słonne Landscape Park, there are three sites (numbered M-1 to M-3) suggested by Professor Zofia Alexandrowicz (Alexandrowicz, 1987, 1991) to be protected as monuments of the inanimate nature.

They are several-meter high tower rocks formed by erosion and described as outcrops of the Lgota sandstone: Eagle Stone, Big Stone and Little Stone, localised in the Eagle Stone Range and on Granicka Mt within the Polanki reserve. The Lgota Beds span the age from the Middle Albian to the Lower Cenomanian; their thickness is about 400 m. The rocks are developed in the lower part as thick- and medium-bedded sandstones, fine-grained, sometimes conglomeratic, green due to the presence of glauconite, with intercalations of black and ash-grey shales and geizes. The middle part of the Lgota Beds is composed of black shales with thin-bedded, horizontally laminated sandstones, while the upper part of spicula geizes, sandstones and calcareous, grey shales as well as of spongiolites at the top. The rocks lie next to marked tourist tracks, being thus easily accessible, and represent attractive places to visit.

M-1. Orli Kamień (Eagle Stone); an outcrop is cut by erosion as a rock wall (45 m long, 3 m wide), a rock tower (6 m long, 5 m high, 2 m wide) and a rock range (?7.5 long, ?1.5 high). It reveals an extremely rich weathering ornamentation.

Fig. 4. A large scarp exposing the Menilite Fm. with the complex of the cherts and marls near Krościenko

Fig. 5. Phosphate concretions in the Węglówka Marl Fm. (shales and marls) in the right tributary of the Wańkówka Stream, N of Olszanica

Fig. 6. A spring of sulphurous water in the bank of the Olchowski Stream near Liszna village

The site is situated in the Eagle Stone Range, 100 m to E of its culmination, close to the red tourist track.

M-2. Duży Kamień (Big Stone); an outcrop of the Lgota sandstone in the form of two blocks capped with the third one (6–10 m long, 3–5 m wide, 13 m long). It reveals a rich weathering ornamentation. Situated on Granicka Mt. within the Polanki reserve.

M-3. Mały Kamień (Little Stone); an outcrop of the Lgota sandstone in the form of a rock wall (16.5 m long, 2 m wide, about 4–6 m high), situated in the south-western side range of Granicka Mt, within the Polanki reserve.

The author has selected four geological sites that should become monuments of the inanimate nature and prepared the project of their protection:

M-4. A large scarp exposing the Menilite Fm. with a well visible complex of the Kotów cherts and the Dynów Marl (Fig. 4). These rocks are exposed as the steep wall, 150 m long and about 30 m high. The outcrop is situated in a distance of 1.4 km from the main crossroads downstream of Krościenko, about 220 m of the bridge, on the right side of the Strwiąż River.

M-5. An accumulation of phosphate concretions (Fig. 5) in the Węglówka Marl Fm. and the variegated shales of the Silesian Unit, in the lower course of the right tributary of the Wańkówka Stream, N of Olszanica (Jasionowicz *et al*., 1959; Szczepańska, Krobicki, 2001). The egg-shaped and ellipsoidal phosphate concretions with diameters up to 0.5 m occur both in the outcrops of the marls and in the alluvia of the stream. It is the richest place with this type of phosphate concretions in the whole Polish Outer Flysh Carpathians.

M-6. A spring of sulphurous water in the left bank of the Olchowski Stream (Fig. 6), flowing along the road to the Liszna village, in a distance of about 2.5 km of the main Sanok–Przemyśl road in Olchowce. The spring is lined with a horizontally positioned concrete semi-ring. In the spring niche and along the water outflow, there are numerous white, pink and violet colonies of the sulphuric bacteria as well as deposits of pure sulphur and gypsum (Rajchel J. *et al*., 2000a, b; Rajchel L., 2000). The content of dihydrogen sulphide is about 8.6 mg H_2S in dcm^3 and total mineralisation of about 800 mg/dcm^3.

M-7. Two springs (Fig. 7) with water of the chloride type and an old well with brine, below the range of the Słonne Mts. in Tyrawa Solna. All these sites are situated S of a dirt road from Tyrawa Solna to the Podczerniawa hamlet (Szymakowska, 1960). The sites lie at the margin of an oil mine field, 100 m upslope of the Artur 32 shaft (Karnkowski, 1993).

Fig. 7. A spring with the chloride type water in Tyrawa Solna

Another, currently filled up well, is situated further west, on the left bank of a stream, close to a field track lined with concrete slabs, about 200 m of the side tarmac road to Podczerniawa. According to written sources, the chloride springs of Tyrawa Solna were exploited for rock salt as early as 1435. Manufacturing of salt stopped in 1772 when the mining facilities were demolished by the Austrian administration in order to protect the state salt monopoly.

GEOLOGICAL-INDUSTRIAL SITES

Other interesting and attractive sites with a geological--industrial character in the Góry Słonne Landscape Park may include abandoned or still working oil wells (Szymakowska, 1961). The reserves of oil are almost exhausted but together with the inactive operations they represent a long tradition of oil exploitation in the region. Currently producing oil wells may form valuable sites of tourist and geotouristic interest, both nowadays and later, after shutting them down.

As for the present, however variable, state of oil exploitation, the areas of the Park with current oil mining facilities or with the facilities only recently shut down include the following.:

GI-1. Łodyna Oil Mine, situated along the road from Łodyna to Leszczowate, in the valley of the stream flowing from Wola Maćkowa, about 2 km of the centre of Łodyna. An elongated area of this deposit encloses the localities of Wola Maćkowa, Łodyna and Brzegi Dolne. Oil mining began there in the second half of the 19th century, and it was then when the scale of exploitation was the largest; e.g. in 1866 there were 18 oil producing dug wells. Oil-bearing strata are represented by five horizons of the Kliwa sandstones and the oil has been pumped from the depths of 386 to 740 m below the surface. It is the paraffin-base crude oil and the deposit is also rich in gas, containing a high content of natural gasoline. The current production is about 8 tons/day.

GI-2. The oil mine in Wańkowa. The mine exploited crude oil from five reservoir horizons of the Kliwa sandstone (Menilite Beds) in the Łodyna Kopalnia fold. The main horizon was situated at a depth of 600–700 m and contained a light crude oil without paraffin. The history of oil mining in Wańkowa goes back to 1887, and the output was the highest in the years before the second world war. In the years 1930–1935, there were more than 150 wells, with the depths exceeding 500 m. The deposit provided about 460,000 tons of crude oil until 1938, and about 1.5 mln ton till the shut-down some years ago. Currently, the deposit does not produce crude oil.

GI-3. The oil mine in Ropieńka pumps its oil from the deposit covering the localities of Stańkowa, Ropieńka, Brelików and Leszczowate. Exploitation commenced in 1886, and the peak of production falls to a period before the second world war. Crude oil was mined from seven wells with depths exceeding 500 m, and a total of 140,000 tons of oil was produced till 1938. Since then, the reserves have almost been exhausted.

GI-4. An oil mine between Tyrawa Solna and Siemuszowa. Crude oil was discovered at the turn of the 19th century or according to some sources, later in 1931, on the Cierniawa hill. The Dienstag company initiated exploitation in 1934, pumping oil from several wells. The crude oil was pipelined to Mrzygłód on the other (left) bank of the San River, and from there distributed farther using tankers. Gas was used for heating within the mine, and after the war, for generation of electricity provided to the surrounding villages. The current annual production reaches 440 tons, and the reserves are almost exhausted.

GEOLOGICAL ASSETS OF THE GÓRY SŁONNE LANDSCAPE PARK

The Góry Słonne Landscape Park is situated within the area of very interesting geological structures. The author has selected 12 profiles within the area of the Skole Unit and three sites within the Subsilesian and Silesian Units for protection as geological reference sites. There are also further four picturesque and geologically interesting sites, suggested to be protected as monuments of the inanimate nature. Similar geotouristic assets are represented by old oil wells present within the Park area. The oil operations, both active and inactive in the future, after shutting them down, may become an unusual addition to familiarisation of public with the geological structure of the Park and the history of oil exploitation in Poland.

The sites selected for protection should be properly marked, and the springs additionally lined, covered, etc. They will become highly attractive elements of the inanimate nature of the Góry Słonne Landscape Park, while the springs will clearly explain the name of these mountains. The sites will extend instructive, scientific and tourist values of the Park, making it more alluring for visitors.

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