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TYPE REGION P-r: POZNAŃ—GNIEZNO—KUJAWY LAKE DISTRICT

The type region „Pr” — Poznań—Gniezno—Kujawy Lake District contains a lowland area situated about 50—190 m a.s.l. The landscape has been formed by the last glacial (Vistulian) and postglacial processes. The Quaternary sediment overlies beds of Miocene Poznań clay and brown-coal facies. In areas with glacetectonic dislocations these sediments are often on the surface.

The lessive soil and leached brown-soil are most common among black-soil formed on Kujawy Lowland and podsollic soils on outwash and dune areas.

The major features of the climate are caused by subatlantic and subcontinental influences. The largest part of the region lies within an isotherm of July temperature +18°C, in some areas the July mean temperature reach +19°C. The mean temperature of January is -1°C in the western part and in the eastern one -2°C. The annual means is 7.6—8.1°C. The lowest annual rainfall is less than 500 mm and for the major part of the region annual rainfall reach about 600 mm.

The recent flora is changed in considerable degree. Synanthropic flora, which replaced natural one is degraded by human activity and it creates more than a half of the area (grade VI of vegetation transformation, Faliński 1975). Less areas have grade II, IV and V (in I—VII scale). Larger forest surfaces are pine woods mostly on dune areas. Deciduous forests are found on small areas only (namely hornbeam forests).

Density of population ranges from 45—60 persons/km², the lowest population is 15 persons/km² and the biggest in cities above 500 persons/km².

Reference site P-14 Skrzyńka Lake (Okuniewska-Nowaczyk 1987): 52°15'N, 16°47'E, 65.5 m a.s.l., age range ca. 12 000—0 B.P. (sediments since Boreal period were considered only). Mesotrophic shallowing lake with adjoining transitional bog placed in a glacial channel. The Skrzyńka Lake is situated in a forest complex belonging to the Wielkopolska National Park.

Following local pollen assemblage zones were separated in Holocene part of sediments (anal. I. Okuniewska-Nowaczyk):

- Sk 1 8775—7815 B.P. *Betula-Pinus-Corylus* paz
- Sk 2 7815—5175 B.P. *Ulmus-Tilia-Quercus-Fraxinus* paz
- Sk 3 5175—4555 B.P. *Pinus-Quercetum mixtum* paz
- Sk 4 4555—4040 B.P. *Ulmus-Pinus-Fraxinus* paz
- Sk 5 4040—2360 B.P. *Quercus-Carpinus-Corylus* paz
- Sk 6 2360—1910 B.P. *Carpinus-Alnus-Betula* paz
- Sk 7 1910— 800 B.P. *Fagus-Quercus-NAP* paz
- Sk 8 800— 0 B.P. *Pinus-NAP* paz

The simplified pollen diagram and L PAZ are shown in Fig. 1.

Reference site P-15 Skrzetuszewskie Lake: 52°33'07" N, 17°23'27" E, 109.1 m

a.s.l., age range 10 500—0 B.P. Eutrophic lake (about 3 ha) is situated in a glacial channel system. Today the surrounding of Skrzetuszewskie Lake is a deforested agriculture landscape. The neighbourhood of this lake is rich in archeological artefacts from the stone age till the mediaeval time.

Two cores were studied (anal. K. Tobolski), from the littoral (S/I) and profundal profil (S/II). Following L PAZ are described in profile S/I:

- S/I 1 ca. 9000—8750 B.P. *Pinus-Betula* paz
- S/I 2 ca. 8750—8050 B.P. *Corylus-Pinus* paz
- S/I 3 8050—6550 B.P. *Alnus-Corylus* paz
- S/I 4 6550—5150 B.P. *Ulmus-Tilia* paz
- S/I 5 5150—3375 B.P. *Quercus-Corylus* paz
- S/I 6 3375—1550 B.P. *Carpinus* paz
- S/I 7 1550— 0 B.P. NAP-*Betula* paz

Simplified pollen diagram showing the main groups of sporomorphs in profile S/I is given in Fig. 2.

Fourteen regional pollen assemblage zones were (temporarily) distinguished for about 2/3 of the area Pr, containing Gniezno Lake District and Kujawy Lowland: Late-Glacial

- Pr 1 to 12 800 B.P. *Cyperacea-Poaceae* paz
- Pr 2 12 800—12 500 B.P. *Betula-Artemisia* paz
- Pr 3 12 500—12 300 B.P. *Salix-Hippophaë* paz
- Pr 4 12 300—11 800 B.P. *Betula-Populus* paz
- Pr 5 11 800—11 000 B.P. *Pinus-Populus* paz
- Pr 6 11 000—10 000 B.P. *Pinus-Juniperus* paz

Holocene

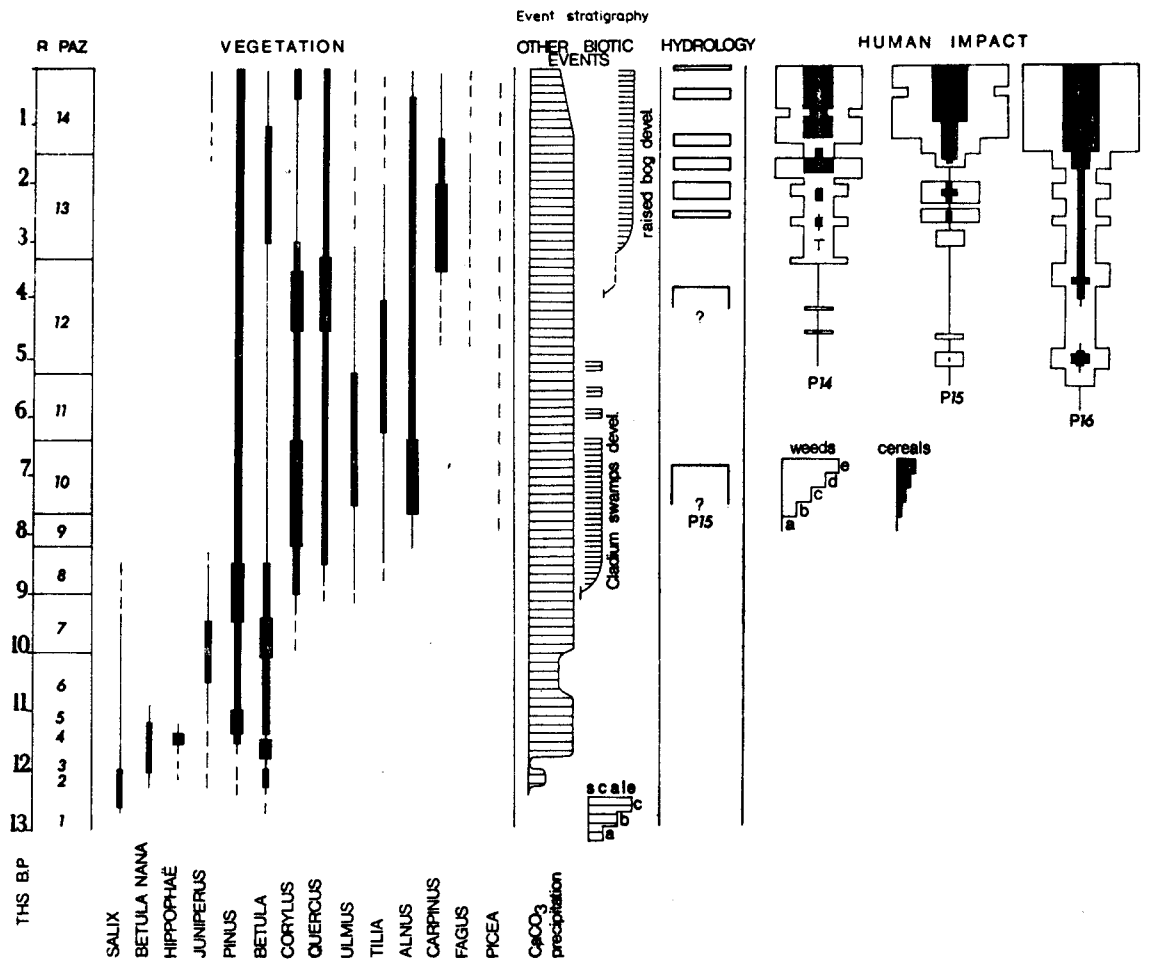
- Pr 7 10 000— 9 000 B.P. *Betula* paz
- Pr 8 9 000— 8 200 B.P. *Pinus-Betula* paz
- Pr 9 8 200— 7 650 B.P. *Corylus-Pinus* paz
- Pr 10 7 650— 6 400 B.P. *Alnus* paz
- Pr 11 6 400— 5 250 B.P. *Quercetum mixtum* paz
- Pr 12 5 250— 3 300 B.P. *Quercus* paz
- Pr 13 3 300— 1 500 B.P. *Carpinus* paz
- Pr 14 1 500— 0 B.P. NAP paz

A very rich Late-glacial flora has recently been found near reference site P-15 in Dziekanowice village (Litt 1988). The bottom part of Late-Glacial sediments contain remnants from a dwarf-shrub tundra with *Salix herbacea* and *Dryas octopetala*. The first rise of birch pollen detected the expansion of *Betula nana* and later *Betula „alba”* (included *B. tortuosa*). After birch expansion (correlated with Bølling) shrub tundra with *B. nana*, *Hippophaë rhamnoides*, *Salix* sp. and *Juniperus* sp. prevailed. Two next L PAZ (connected with Allerød) show a rather dense birch and later a birch-pine forest. The last Late-Glacial L PAZ, corresponding with Younger Dryas, is characterized by a *Juniperus* and herbaceous heliophytes close curve.

It is also possible to divide into some subzones illustrating the differentiations caused by local factors responsible for migration and colonization of plants on dune areas, river terraces and sites rich in calcium carbonate.

Holocene development of plants was similar only in Preboreal and Boreal periods. Later considerable differentiations are shown in both reference sites. Especially deciduous forest prevailed in Gniezno Lake District. A special role played hornbeam with different trees structure to the contemporary *Quercus-Carpinetum*. Change in forest cover caused by appearing at hornbeam was showed in the programme „Zonation” marking out a very distinct line in this place.

An early and distinct human impact was noted on Kujawy (P-16 — Gopło



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Fig. 3. Correlation table „Event stratigraphy”. Hydrology: high water level in P-15; CaCO³ precipitation: 1 — low, 2 — intermediate, 3 — high; Man: a — hypothetical or slight, b—c — different stages of activity

Lake (Jankowska 1980), secondary reference site on Fig. 3). In Central Wielkopolska are correlation between *Ulmus* decline (5150 B.P.) and presence of first pollen grains of *Triticum*. Permanent deforestation of the major part of the area in Kujawy and in Central Wielkopolska started about 1500 years ago. Spread of more important trees and shrubs, human impact and other events are illustrated in Fig. 3 (Tobolski 1988a, 1988b).

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REFERENCES

- Faliński J. B. 1975. Anthropogenic changes of the vegetation of Poland. *Phytocoenosis*, 4 (2): 97—116.
- Jankowska B. 1980. Szata roślinna okolic Gopła w późnym glacie i holocenie oraz wpływ osadnictwa na jej rozwój w świetle badań paleobotanicznych (summary: The vegetation in the Gopło region in the Late Glacial and Holocene and the influence of settlement on its development in the light of paleobotanical researches). *Przegl. Archeol.*, 27: 5—41.
- Litt T. 1988. Untersuchungen zur spätglazialen Vegetations-entwicklung bei Dziekanowice (Umgebung Lednogóra, Wielkopolska). *Acta Palaeobot.*, 28 (1, 2): 49—60.
- Okuniewska-Nowaczyk I. 1987. Late Holocene history of the vegetation growing in the vicinity of Lake Skrzyńka, the Greater Poland National Park, obtained from pollen analytical data. *Acta Palaeobotanica* 27 (1): 137—151.
- Tobolski K. 1988a. Wstępna informacja o postępie badań postglacjalnej historii roślinności na Nizinie Wielkopolsko-Kujawskiej. *Archaeologia Interregionalis* (in press).
- 1988b. Nowe fakty z historii lasów środkowej Wielkopolski w okresach brązu i żelaza. *Sprawozdania PTPN za 1987 rok.*

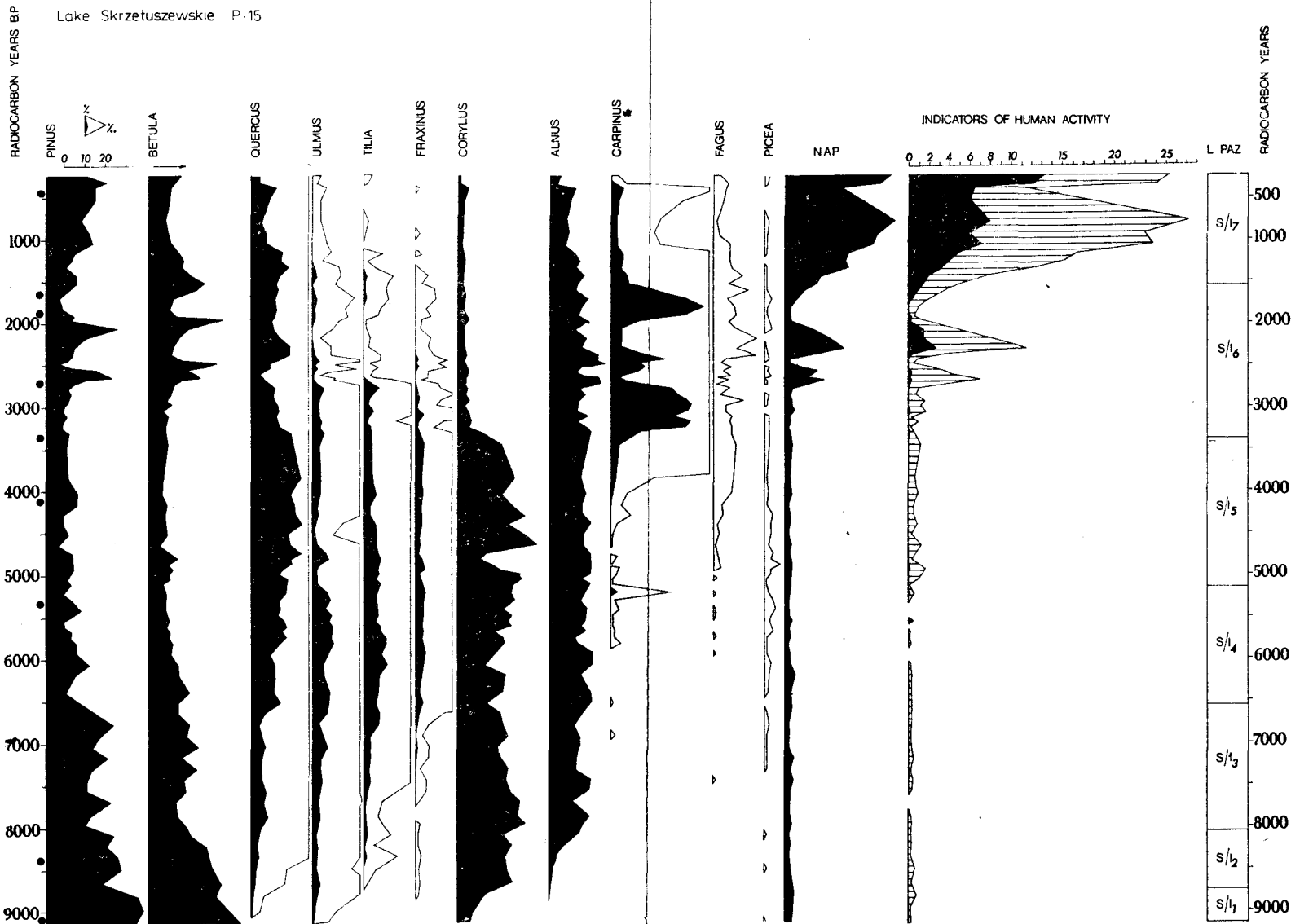


Fig. 2. Skrzetuszewskie Lake (P-15). Simplified pollen diagram

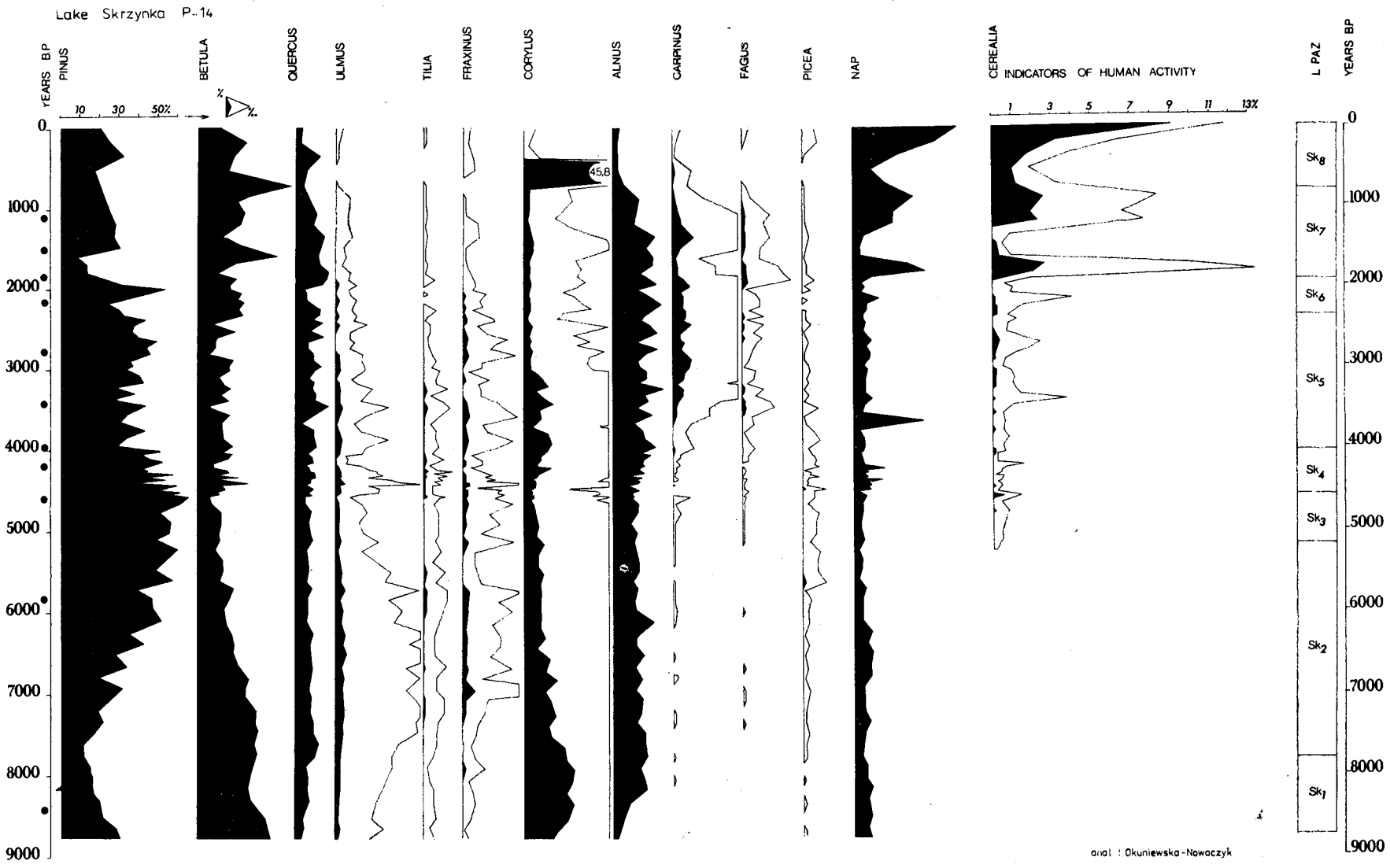


Fig. 1. Skrzyńka Lake (P-14). Simplified pollen diagram