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TYPE REGION P-d: THE JASŁO-SANOK DEPRESSION

The Jasło-Sanok Depression is the largest decrease within the whole range of Polish Carpathians.
Location: longitude 21°20′—21°70′E, latitude 49°60′—49°80′N.
Altitude: ca. 230—400 m a.s.l.
Climate: mountain climate, with remarkably continental characteristics; mean January temperature —3.5°C, mean July temperature 18.2°C, mean annual temperatures 7.5—8.1°C; precipitation 696 mm/yr. Southerly and southwesterly winds prevailing.
Geology: the Quaternary valley fill is to 8 m thick. Low resistant Krosno Beds Oligocene age appear in the Jasiołka channel.
Topography: the area consist of a series of flatbottomed valleys separated by series of small hills.
Soils: alluvial soils-muds occurring in valleys, and feebly acid and leached brown soils, sometimes pararendzinas from slope rainwash (deluvial soils).
Vegetation: the study area is recently covered by fields and meadows that are mainly fresh meadows (*Arrhenatheretum elatioris*). Much less space is now occupied by wet meadows of *Molinion* or *Calthion alliances*. On small, flat hills stands of mixed deciduous lime-hornbeam forests (*Tilio-Carpinetum*) developed, the East-Carpathian variety with beech being dominant. Patches of mixed acidiphilous oak-pine forests (*Pino-Quercetum*) are less frequent (Towpasz M.S.).
Population: approx 84 persons/km^2, villages, town Jasło.
Settlement: the development of human settlements in the area confirmed by archaeological evidence started in the early Neolithic (Machnik 1960, 1962). More significant human influence started in the late Neolithic when the people of the Corded Ware Culture living mainly on animal husbandry spread out. Further intensification of the settlement process took place in the Bronze Age during the rise of the Lusatian Culture (Żaki 1955) while agriculture and cattle breeding were still prevailing occupations. There is no data on the settlements in the early Iron period when an old trade route crossed the region along Wisłoka River Valley. Actually the intensive development of human settlements in the region took place during 13th—15th centuries. The settlements were located according to the German Law within an area flanked by Wisłok and Wisłoka rivers (Żaki 1969, Kunysz 1970).
Land use: forests less than 10%, arable land and meadows about 85%.
Reference sites: The Jasło-Sanok Depression was an object of paleoecological studies by many authors (Szafer & Jaroń 1935; Szafer 1948; Wołoszyńska 1950; Klimaszewski 1948; Koperowa 1970; Harmata 1987; Wójcik 1987).

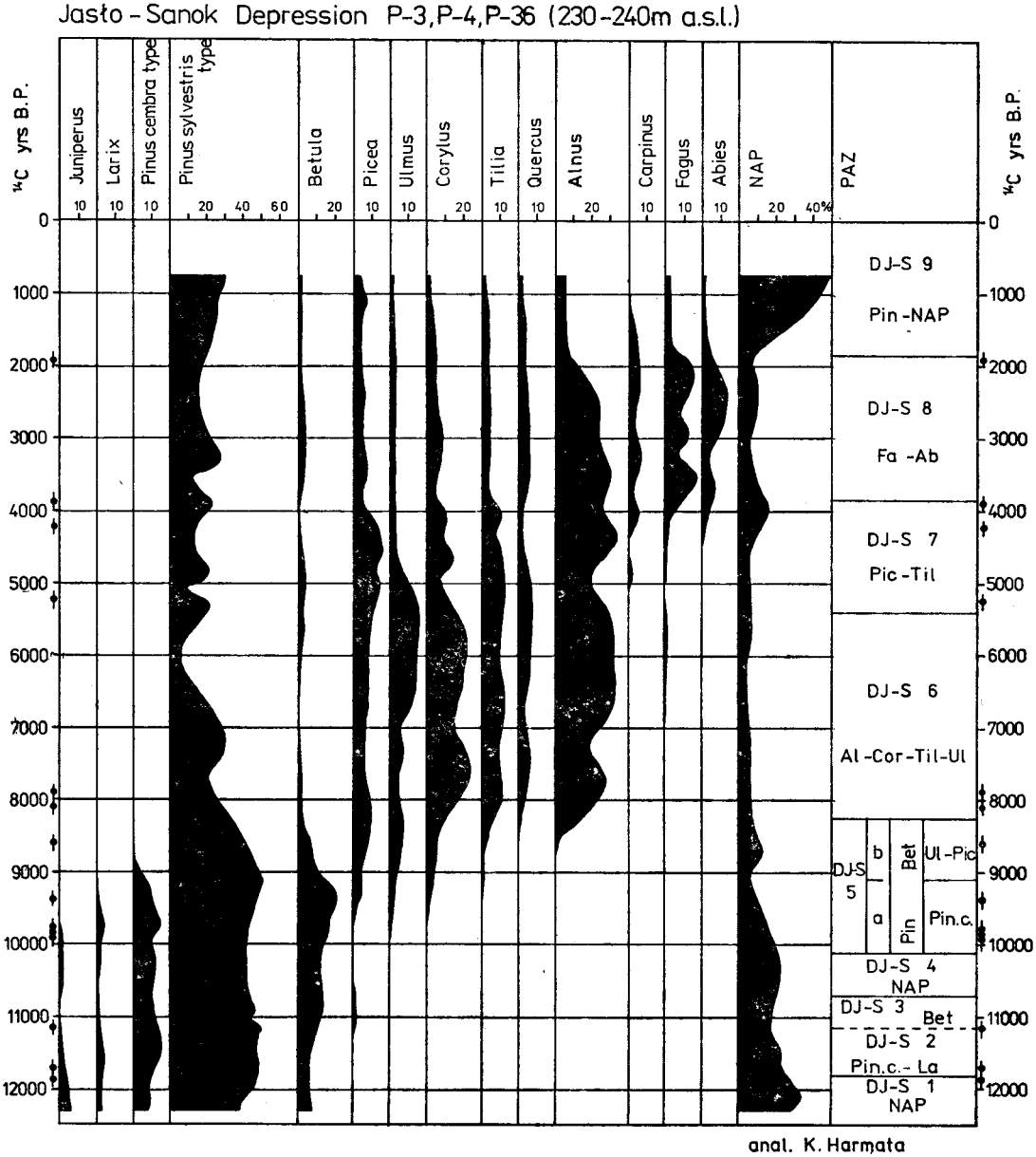

Fig. 1

There were 3 reference sites studied: Roztoki (2 profiles), Tarnowiec (1 profile), and Jasło (1 profile). All profiles were collected from the exposures.
Long. 21°45′, lat. 49°65′, 230—240 m a.s.l.
Age range: ca. 12 300 B.P. — 1500 B.P.
Besides pollen analysis, macrofossils have been studied in Roz. a, and Tar. e. 14 ^{14}C dates. The correlation of results for all the profiles is presented in Table 1. The changes in regional vegetation are presented on a schematic smoothed pollen diagram (Fig. 1), and in „Event stratigraphy" table (Fig. 2). The results ^{18}O analysis are presented in the column concerning climatic events (Różański et al. M.S.).

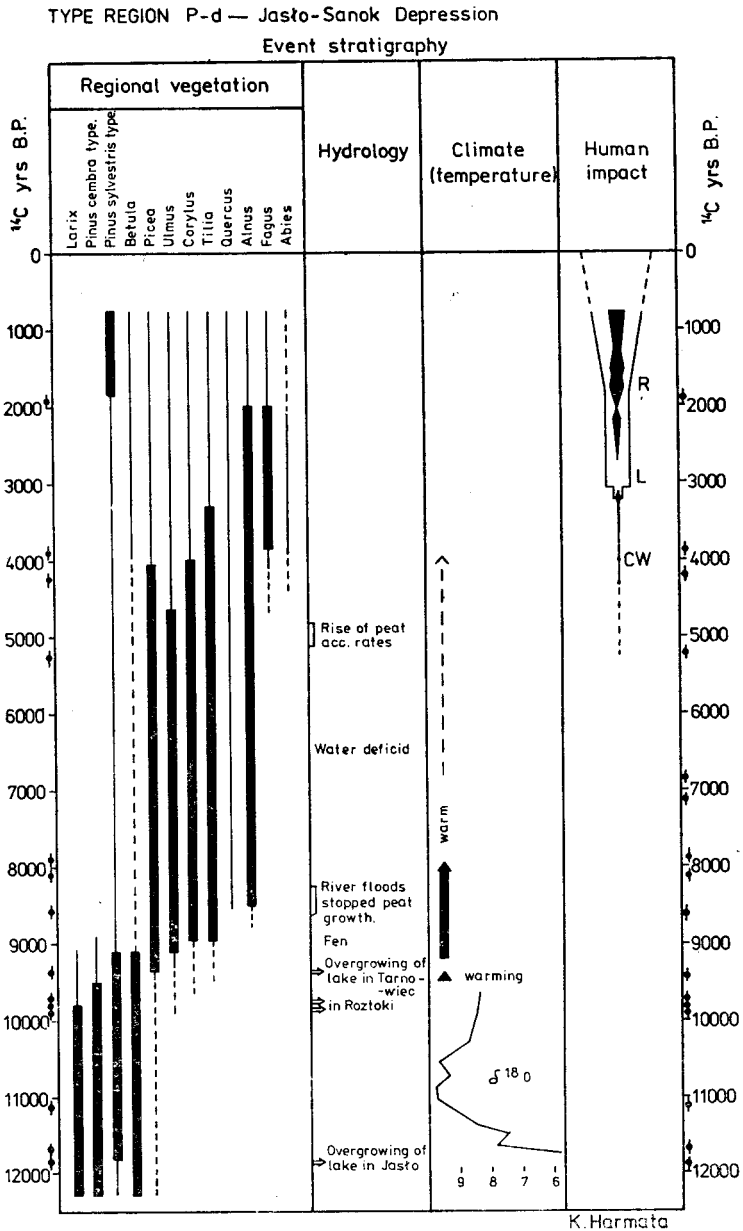

Fig. 2

DISCUSSION

Regional vegetation:

1. In the Older Dryas the area Jasło-Sanok Depression was occupied by a park-type landscape. Shrub and herb communities including heliophilous species were common, but there were also trees present, what is confirmed by macrofossils: birch nutlets (*Betula pubescens*), needles of *Larix*, seeds of *Pinus*, and seeds of *Picea*. The curve for *Picea* pollen does not exceed 0.5%. The data obtained so

far from Nowy Targ Basin, West Bieszczady Mts., and Jasło-Sanok Depression reveal the earliest traces of spruce in the Polish Carpathians coming from Allerød (Koperowa 1962, 1970; Gerlach et al. 1972; Środoń 1967, 1977; Ralska-Jasiewiczowa 1980).

2. Allerød was the period when *Larix-Pinus cembra* forests with common pine and spruce dominated. Birch was important in the Jasło-Sanok region from Older Dryas to Preboreal period.
3. The Younger Dryas witnessed the progressing shrinking and thinning of the forested areas and reversion of park landscape. The presence of *Alnus* in this period is confirmed by fragments of wood though in the pollen diagrams from Tarnowiec and Jasło only single pollen grains of *Alnus* were found. The fossil of *Alnus* from this period were also found at Besko (Koperowa 1970). In the Bieszczady Mts. *Alnus* (non-*viridis*!) appeared much later.
4. The Boreal period was marked by quick spread of *Ulmus* and *Corylus* and later of the other components of thermophilous deciduous forests. Forests with spruce and alder developed in the depressions of the rea.
5. The Atlantic period is represented only in pollen diagrams Roz. b (fragment) and Tarnowiec. It is represented by a very short sediment series and difficult to distinguish.
6. In the Sub-Boreal period forests with beech and hornbeam expanded. In the older part of the period (about 3900 B.P.) fir appeared. It was in Jasło-Sanok Depression later than in Beskid Niski Mts. (Szczepanek 1987) but earlier than in Bieszczady Mts. (Ralska-Jasiewiczowa 1980).
7. The computer zonation confirmed the correctness of zones distinguished in this study.

Hydrological and climatic events: in the Jasiołka valley between Jasło and Roztoki the lacustrine sediments occur under the cover of silts and alluvial clays.

The accumulation of lacustrine deposits have begun from the Older Dryas, continuing until the Holocene. The peats developed on lacustrine chalk at the marginal parts of reservoir already at the beginning of the Allerød.

At the beginning of Holocene the lake was the subject of flowing down-water level lowered, and probably some part of the lacustrine chalk deposits was eroded (Wójcik 1987).

Since the beginning of the Holocene in the region of Roztoki the accumulation of the peats layers ranging from several cm up to 1 m was common.

The development of peat bogs was disrupted by the overflooding by clays and next of alluvial loams. In the Atlantic period the peat bog at Roztoki was already buried, while in the hollows without outlets (Tarnowiec) the accumulation of peats still lasted. The accumulation biogenic deposits terminated about 2000 years B.P.

The climate during the Younger Dryas must have been milder than in the Older Dryas, what is indicated by presence of *Nymphaea alba*, *Cladium mariscus* and *Dryopteris thelypteris* at Roztoki and Tarnowiec, and also by a prominent pollen curve of *Filipendula*, and results of oxygen-isotope analysis (Fig. 2). A cooling of the climate occurred not earlier than in the younger part of this period.

Human impact: Atlantic period some indistinct traces of human activity were found. Traces of human activity are evident about 4300 B.P. It was presumably the Neolithic settlement of the Corded Ware Culture.

The progressive devastation of forest communities caused by human activities started about 2000 B.P.

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Table 1

Correlation of local and regional pollen assemblage zones with macrofossil assemblage zones in references sites of Jasło-Sanok Depression