

# HISTORY AND PRESENCE OF THE SOFRONKA ARBORETUM

Jan Kaňák (Lesnická práce, 1999/1)

## RESUME

In 1998, the Czech forestry community commemorated 35th anniversary of establishment of the scientific genetic and forest tree breeding station and arboretum Sofronka close to Plzeň. It was initiated and founded by the important Czech forester Ing. Karel Kaňák, CSc., who gathered a unique collection of world species assortment of Pinus class there. Within the studies of the Pinus class a number of experimental plots was established all over the CR. The plantations were done in the form of sample populations in order to examine the habit of each sample not only from the point of genecological differentiation but from the forestry one as well. A great number of population samples of different provenance gives the chance to study the effects of site selection press over the whole territory of the species range. This approach to the research was inspired by N.I.Vavilov's ideas. The cultures are allowed to evolve naturally by natural selection, as the research station does not deal with wood production, but with gathering information on studied species biology and evolution under synergy of all natural evolutionary factors.

## Some important theoretical conclusions of the research

- Genetic classification of pine stands.
- Results of provenance research: E.g. identification of the quickest growing local Scotch pine populations by comparing measurement results from experimental plots located at different site quality conditions; further on, continental and oceanic climatypes of *Pinus silvestris*, *P. banksiana*, *P. contorta* were described on mapping of examined feature values (this study brought important information on biology and evolution of some species of the Pinus class).
- Description of the upland variety taxon of the Scotch pine and participation in its re-introduction into forestry practice: The upland variety of the Scotch pine is known from many mountains of Central, Southern, and Eastern Europe as a component of special communities of upland and mountainous localities. Although its importance for spruce stands stability is indisputable, it had been neglected long both by botanists-systematics and forestry practice as a strange element introduced artificially in mountainous localities. If we omit some morphological differences from common Scotch pine from highlands it differs above all by the fact it behaves as the climax type in stands. The highland type of the Scotch pine plays the role of a pioneer in an ecosystem, occupying modest sites and naturally occurring in monocultures. It is intolerant to competition of other species to the contrary to the upland type, which is the climatype and occurs as an admixture to spruce, beech, and fir stands. It regenerates under shelterwood and its plantations on open clearings suffer from direct sunshine and turn yellow in scorching sun. Some morphological features of the upland type show it has originated from hybrides of *P. sylvestris* x *P. unciata* or *P. mugo*. This fact corresponds with an increased resistance to immission load.
- Protection of forests in immission regions of Krušné hory Mts.: The study and practical knowledge resulted in formulation of a long-term silvicultural strategy simulating the evolution of forest Krušné hory Mts.' ecosystems in postglacial period. The pioneer (primary) stage of succession is ensured by aggressive pioneer species resistant to immissions, later beech and vegetative progeny of resistant Norway spruce of local provenance and further even autochthonous fir (preserved above all on the Saxonian side of Krušné hory Mts.) will be planted. After these underplantations overgrow the pioneer layer the "pioneers", generally exotic, are harvested. There remains the mixture on the site, analogous to the composition occupying the territory before the first harvesting interference of man, so called "climax stage of succession".
- On gathered knowledge on importance of various cultivated species studies covering all area a new term has been introduced, so called **evolutionary dendrology**. This deals with getting information from various geological periods on the behaviour of a species in a respective period, on species compositions it participated in, on effects influencing it. Information on its migration during postglacial and from then so far are important as well, including the way its area has been evolving. Geological history of our species and their evolution so far have to be considered above all in silvicultural manipulation with these species. The evolutionary dendrology recovers the trust in trees' abilities and doubts on anthropogenous interventions

into their silviculture ignoring genetic adaptations created and fixed for millions of years. Evolutionary dendrology then can be defined as a basis for treatment of species in harmony with their ecological adaptations, created and fixed during geological periods of these species' evolution in connection with evolution of their areas and their forest ecosystems.