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## An example of the influence of man on the pollen diagram

By JADWIGA DYAKOWSKA, Cracow

The young-holocene peat-bog from Szczawnica, which was investigated by the method of pollen analysis by Mrs. Wanda KOPERA is a very good example of the influence of man on the composition of pollen rain.

Szczawnica is a health resort situated at the foot of Pieniny Mountains in West Carpathian. Its altitude above sea level is 500 meters. The natural vegetation of the altitude zone of our peat bog consists of forests of fir with beech and fir with spruce.

The peat-bog of Szczawnica is a very young one. Its pollen spectra represent the history of forests of some few hundred years of the historical period. It gives us the possibility to synchronise some levels of the pollen diagram with the data of human history.

The composition of tree pollen in the pollen spectra corresponds quite well to the composition of the natural vegetation in West Carpathian in the late holocene. The pollen diagram demonstrates it. The left part of the diagram is normal-dissolved, the right one is a total diagram specially constructed in order to demonstrate better some phenomena.

In the whole profile we have the preponderance of the spruce pollen, besides which there are greater quantities of fir, beech and alder pollen, and small quantities of other geni of trees (oak, lime, elm and birch) and of hazel.

The course of the curves of all those trees oscillate more or less.

The course of the curve of the genus *Pinus* is quite different. It runs through the diagram nearly without oscillations at the height of ten to fifteen per cent. It may be best seen on the total diagram. The scotch-pine appears now in Carpathian Mountains only in few relict sites which originate from the Late-glacial. The nearest sites of pine are to be found in Pieniny, where it grows in small clumps on the tops of the rocks and in so called «Bory Nowotarskie» (a big complex of raised peat-bogs) which are situated about 35 kilometers from Szczawnica. The scotch pine covers there the raised peat bogs.

The surface of our peat bog was overblown by the pollen from these relict sites in nearly the same quantities yearly, during the whole period of growth of the peat.

As it was mentioned above, the natural forest vegetation of the environs of Szczawnica consists chiefly of fir, spruce and beech.

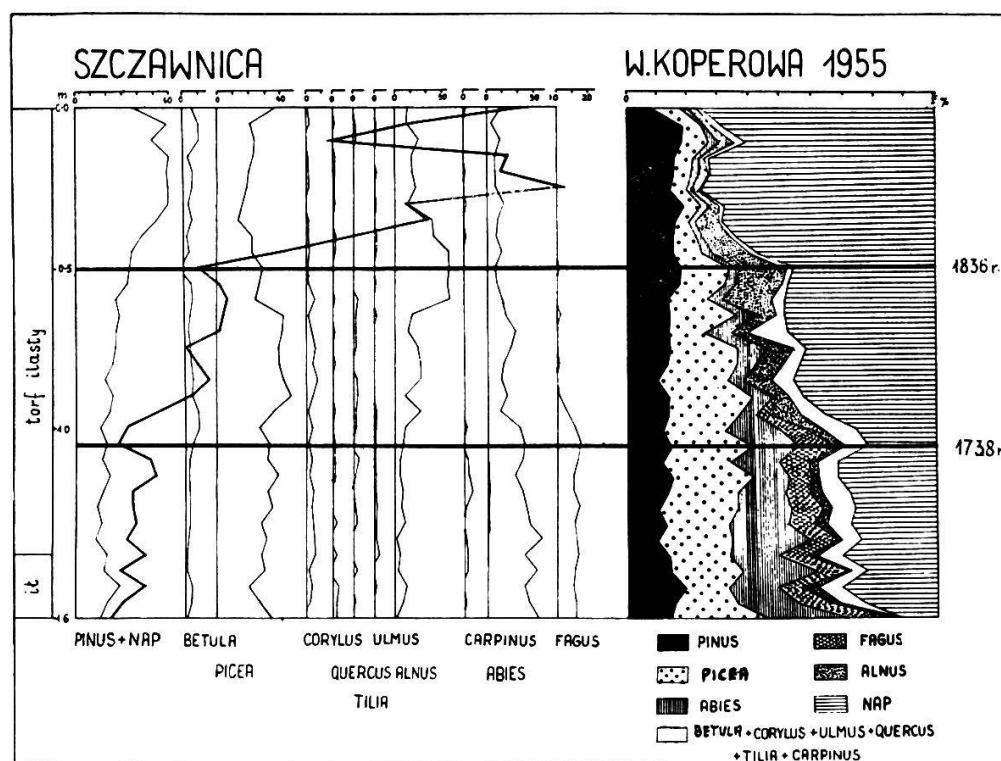
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<sup>1</sup> HEINONEN, Leo, 1957: Studies on the Microfossils in the Tills of the North European Glaciation. — Ann. Acad. Scient. Fennicae, A III, 52, pp. 1—92.

The lower part of the pollen diagram reflects clearly this state of things. At the level of the 1,10 meters an abrupt change comes for. The quantity of beech pollen decreases rapidly, so that after some levels the curve of this tree disappears completely.

How can we explain this phenomenon? The explanation is quite simple. In the year 1738 in Jarmuta situated about 1,5 kilometer from Szczawnica, a foundry was established. Then began the clearing of forests and especially of beeches used as fuel for this foundry. Therefore we can write the date 1738 at the level 1,10 meters (Of course it will be more correct to write this date a little below the top of the beech-curve).

Above the horizon signed with the date 1738 no acute oscillations in the course of the curves can be seen. Only the curve of non-tree pollen increases smoothly and the curves of tree-pollen decrease.



In the depth of 50 centimeters a new change occurs. All the curves of tree-pollen — the pine except — decrease rapidly, the curve of NAP increases. This phenomenon can be also explained by the activity of man. In the year 1836, as the result of the discovery of medicinal qualities of the surrounding mineral springs, the health resort Szczawnica was established. Its development caused the new clearing of neighbouring woods. This afforestation of the environments of Szczawnica is reflected in the preponderance of the NAP curve in the higher part of

the pollen diagram. We can put also in our diagram the second mark-level which can be strictly determined with a date, — the date of the establishment of the health resort — 1836.

It may be interesting to know, that the curve of *Pinus* pollen did not reflect in any way the changes of the vegetation surrounding Szczawnica. It is a proof that the pollen of pine is overblown from more distant environs.