

### XIII. A DEMONSTRATION OF THE TECHNIQUE OF POLLEN ANALYSIS

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It is believed that analyses of fossil pollens from post glacial bogs are valuable aids in tracing the succession of plant associations in such bogs during post glacial times. These analyses also give clues to the various types of climates which have prevailed throughout this period; because the types of vegetation existing at any one time are dependent on the climate. Quite a bit of work on fossil pollens has already been done in Europe but, to date, very little has been done in America.

Pollens are more or less extensively preserved in bogs whose reaction is acid in character. This is due to the fact that the outer wall of a pollen grain is composed of compound esters and fatty acids. Such a substance is not affected by inorganic acids, but is saponified when exposed to the action of alkalis. (For this reason, pollen grains are not found in appreciable numbers in bogs whose reaction is alkaline).

In collecting material to be used in pollen analysis, a series of borings are made in each bog. Samples of peat about the size of a walnut are taken at suitable intervals, usually about one foot apart. Every precaution against contamination is taken. The samples are carefully dried to prevent possible contamination. The purpose of a series of usually two or three borings is to insure a check on pollen counts. The borings are taken wherever possible from the oldest part of the bog, for here the records are most complete in point of time.

In preparing peat samples for mounting, the body of the peat must be broken down, and the pollen grains freed from the rest of the material. The pollen grains seem to act as centers of attraction or as nuclei for masses of gummy and fatty residues in the peat. To break up or deflocculate these masses, it has been found advisable by earlier workers to boil rather minute amounts of a given peat sample in a weak alkaline solution. A 10% solution of potassium hydroxide or a full strength solution of ammonium hydroxide is generally used for this purpose. In the work being done at the present time, it was found necessary to heat a small amount of the sample with potassium hydroxide at 80 in a constant temperature oven for from 8-24 hours to effect complete deflocculation.

A drop of the deflocculated material was mixed with a drop of clearing solution on a slide; the cover glass was put in place, and the mount sealed with gold size. The clearing solution used was glycerine-phenol and lactic acid-2-1-1. In addition to clearing the mount, the clearing solution stops the action of the alkali. As has been shown, alkalis, if allowed to act for a sufficient length of time will etch the outer wall of the pollen grain; and will eventually destroy it.

The accompanying charts show graphically the results of a count made from a series of slides from successive levels of a bog near New Haven, Ohio. Certain interesting fluctuations in the percentages of grasses and trees at various levels of the bog are shown. However it is felt that at the present time results are too incomplete to permit of the drawing of any conclusions.

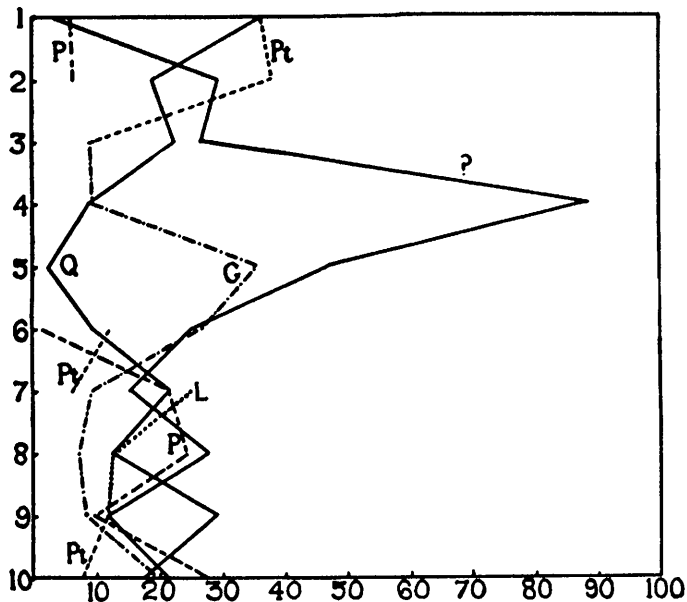


Fig I. Graph showing recurrence of Pollens in New Haven Bog.

Pt=pteridophyte spores

?=unknown

G=grasses

P=pines

Q=oak

L=larch