

## Vegetation Ancient and Modern

Those who suffer from hay fever are only too well aware of how our air can be filled with pollen at certain seasons. Also, we are constantly being reminded of climate change. The two subjects do, in fact, have some connection in that climate influences our flora and both have changed in the past, especially with the coming and going of Ice Ages. Since then, human activity has also played a part by developing farming.

Pollen grains have tough coats in order to survive their aerial journeys and also distinctive shapes in order to 'key' into matching female flowers. As a result, they can still be recognised after many years where they have fallen into wet sediments or peat. In this way, the successive layers in the many 'meres and mosses' of the Shropshire Cheshire plain, including those in Bicton, can hold a record of vegetation changes since the last Ice Age.

By noting the percentage of different types of pollen in samples taken from successive levels, researchers can construct a 'pollen diagram' illustrating how the vegetation has changed over time. Absolute dating by 'Carbon 14' analysis can also help where suitable material is available. Information from many sites can then be pooled to provide an overall picture of the region as illustrated here.

One must use caution in the interpretation, since local situations may have influenced results, while some species preserve better than others. Also, waterside plants like alder may be over-represented, while others, which do not rely on wind dispersal, may be under-represented in the record. Nevertheless, certain selected species can be good indicators of the type of vegetation present at each period and enable researchers to recognise distinct 'zones' during the last 13,000 years.

In Zone one, an icy landscape was giving way to open grassland, which included many 'weed' species, which, as every gardener knows, quickly fill up any bare ground. As permafrost and even larger masses of buried ice slowly melted, the characteristics such as those at Oxon and Calcott appeared, trapping the pollen in their muds (and passing mammoths).

Temperatures were actually rising quite quickly to almost modern levels, judging by insect remains, but tree cover was slow to develop as seed sources were still remote. Only the usual pioneers, birch and pine, took over defining Zone 2. Before more mixed woodland could develop, however, a sudden reversal of the climate occurred, bringing small glaciers back to our local Welsh summits visible from Bicton for the next few centuries.

One explanation for all this could have been the way the progressive shrinking of the Canadian ice sheet first created a vast lake over the northern prairies and then suddenly released it all down the St. Lawrence, when it shrank further. Such was the volume of fresh water, that it altered the behaviour of the Gulf Stream Drift, thus plunging Europe back into cold conditions. Another idea is that an asteroid exploded in the atmosphere, making it so dirty that the whole earth was plunged back into an Ice Age. Both could be true as there are chemical hints that the impact might have been the very force that broke that Canadian ice sheet.

Eventually, however, warming returned and the succession to woodland via 'pioneer' trees carried on where it had left off giving the character to the next two 'Zones'. As mixed high forest covered

the surface more shrubby species were shaded out. Such forest would have been the home to Mesolithic 'hunter gatherers' who had little impact upon it, but by 5,000 years ago things began to change with the 'Neolithic' revolution.

From now on in 'Zone 7b', the woodland was under attack from 'slash and burn' shifting cultivation and grazing by domestic animals. Elm and lime almost disappeared, perhaps from a combination of disease or selective exploitation. By contrast, there was a revival of hazel, perhaps because it could withstand the 'coppicing'. Most marked, however, was the return of open grassland and weed species, so that the whole landscape was becoming a type of 'temperate savanna'.

Neolithic and Bronze Age farmers were partially nomadic, so that they may have had a widespread impact out of proportion to their actual numbers. Late Bronze Age and Iron Age communities, however, became more settled and cultivation was more permanent to cater for a large population, so that typical weeds of cultivation appeared. Also, some light soils, which were initially so easy to work, now showed signs of exhaustion and were only fit for heather. All this disturbance was also allowing local soil erosion to contribute sediment to some shallow pools, sealing off original peat layers, until rediscovered by any unsuspecting developer in modern times in our area.

From the Iron Age to modern times, Zone 8 cultivation has generally expanded at the expense of woodland, but details do show some variations as population fluctuated with wars and famines. We might discuss these some other time, but for now it is worth pointing out that in the last centuries of the diagram, tree pollen appears to have increased in spite of ever more intense farming thanks to the deliberate planting of woodland and hedgerows. This is a habit we might usefully continue, as we reflect upon all those changes in the past.

Generalised pollen diagram for the Cheshire - Shropshire area. Only the major pollen types are shown.

