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POLLEN ANALYSIS OF SEDIMENT SAMPLES FROM GOUGH'S CAVE, CHEDDAR

by

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(translated from the French original)

In 1949 and 1950 two pits were dug by A. V. Painter at the back of the Vestibule in Gough's Cave, Cheddar (Donovan, 1955; and excavations B and C in FIG. 4, this volume, p. 109). The sediments were divided into 6 inch (15 cm) spits, numbered downwards from the top.

Sediment samples from spits 11, 12, 13, 14, 15, 16, and 17 preserved in the Department of Palaeontology at the British Museum (Natural History) provided the material for the pollen analyses reported here. This range of samples corresponds with the main concentration of Late Palaeolithic flint tools and flakes (Jacobi, this volume, p. 111).

The samples took the form of large, dense blocks of sediment, retained because they still contained pieces of bone or flint. Given the floods that have from time to time affected this area of the cave, it was important that all external parts of these samples were thoroughly cleaned to remove recent contamination of any once exposed surfaces. In 1977, John Campbell (pp. 98-99 and fig. 70) published analyses of six samples from this site. In these, willows (*Salix*) represented more than 60% of the tree pollen and Cyperaceae are totally dominant. In Campbell's results we appear to be seeing pollen from the Lateglacial period being swamped by pollen introduced by later flooding.

In this study we encountered one more-or-less similar pollen spectrum in a sample from spit 14. The results of a second sample from this spit are therefore preferred (FIG. 1). There are other allochthonous components in the samples, in this instance posing no problems of interpretation as they consist of very ancient spores and hystrichosphaerids (acritarchs/ dinoflagellate cysts).

The two lowest samples, from spits 16 and 17, proved extremely poor in pollen. They are included in FIG. 1 since, even though the numbers preclude calculation of meaningful percentages, it is worth noting that exactly the same forms are represented as in the other spits.

The spectra appear just what one would expect from the vegetation of a dry landscape during the Lateglacial period. The flora is dominated by the liguliflore Compositae (Cichorieae) with *Artemisia, Armeria,* and Chenopodiaceae. Around a living site, fragile plants would be destroyed by human trampling, but other more resilient forms such as the dandelions (Cichorieae) will always grow back! Even given that dry conditions favoured the Cichorieae during the Last Glaciation, it is evident that over-representation might be due, in part, to the effects of strong local human presence in certain areas. Furthermore, the occupants moving between water and the cave would probably have introduced some pollen of

Cyperaceae, Polygonaceae, and *Hippophae* (buckthorn). The number of grains of these forms actually present is nothing like that which would be produced by flooding.

Tree pollen does not exceed 10% in any sample. The presence of pine on the Continent before the Allerod (later part of the Lateglacial Interstadial) has very often been contested, based upon the reasonable argument that the pollen of this conifer can be windborne over large distances. However, the author has always accepted the genuine local presence of this tree type in continental Europe given its constant occurrence in spectra from broadly contemporary Magdalenian sites in the Rhineland. At Gough's Cave the low frequency of pine pollen and its absence from some samples may offer a real contrast with this continental evidence. They suggest that pine did not grow in the Cheddar region, a conclusion which could also be drawn from Campbell's group of analyses.

In Cheddar Gorge, birches (*Betula*) and junipers (*Juniperus*) would have gained a hold in the interstices between the rocks, while free water would have permitted the presence of the two classic genera which we can follow northwards up the rivers of Germany, Belgium and France, the alder (*Alnus*) and the hazel (*Corylus*). However, there is not a single pollen grain here of any more temperate tree than these.

As was stated by Campbell, prior to his work no pollen analyses had been carried out in 'calcareous British cave deposits' (1977, p. 11). Within dry limestone landscapes, research has centered on Holocene sites. Moreover, lake and peat sequences extending back as far as the Lateglacial are highly localized within the British Isles.

In northern Britain, the glaciers had been on the wane since 17,000 B.P. Any permafrost zone was, therefore, already some distance away from the Cheddar region during the terminal Palaeolithic. Thanks to the humidity brought by springs and streams, and to the shelter provided by the cliffs, gallery woodlands, with alder, willow and hazel, were able to develop. These would have offered additional environments to animal populations.

A steppe vegetation covered wide areas supporting horse, the principal species in the Gough's Cave fauna. The flora prohibits use of the term 'tundra' here. A tundra environment would anyway fit badly with the faunal data (Currant, in prep.).

From the Ukraine to Wales, prehistoric people probably made extensive use of river valleys, the natural migration routes of the rich steppe fauna. In front of Gough's Cave was a narrow valley, sheltered from the winds, where Late Palaeolithic hunters could lie in wait for the animals which came to the risings. They could cut wood, but probably only in small quantities, and could find a diversity of vegetable substances.

All the pollen spectra can be interpreted as representing only one climatic type, cold and dry, without perceptible fluctuations. Botanically speaking, a Lateglacial age for these spectra is perfectly possible. Since no long Late Devensian palaeobotanical record yet exists for any limestone area of England, the results reported here cannot be dovetailed into a broader stratigraphic framework.

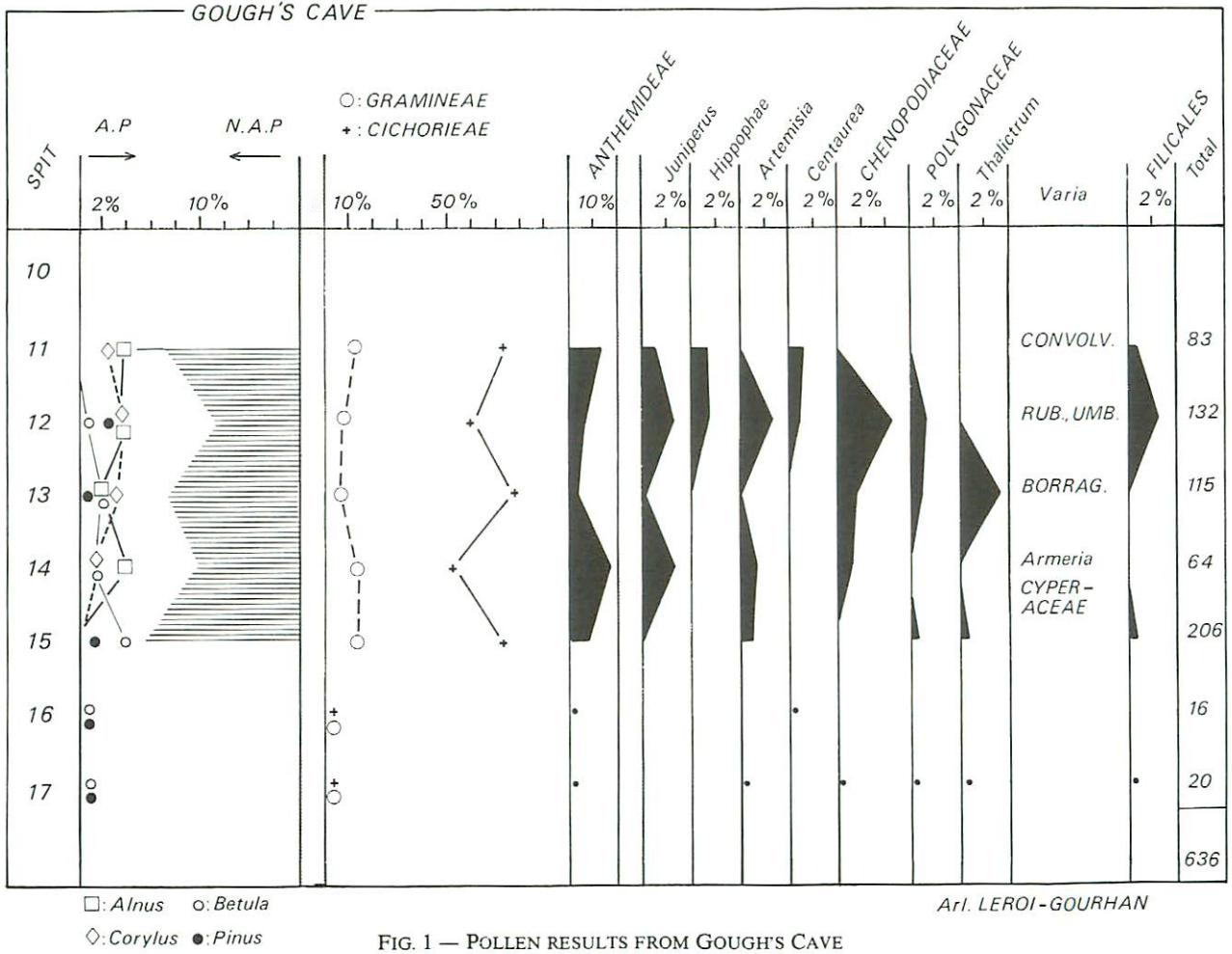

FIG. 1 — POLLEN RESULTS FROM GOUGH'S CAVE

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