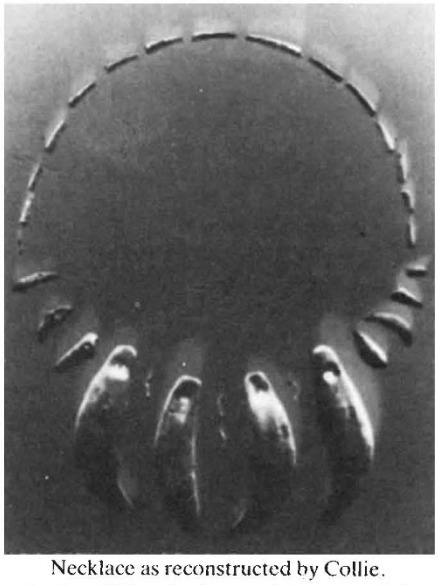
Archaeology

Rediscovering French ice-age art

from Randall White

To achieve new insights into the archaeological record, it has become almost as important to discover and reanalyse that which archaeologists have lost, ignored or misplaced as it is to recover new examples of materials lost or discarded by prehistoric peoples. In 1980, I began a systematic inventory of French Upper Palaeolithic (35,000–12,000 years ago) materials in American institutions. This has revealed a collection probably more significant than any other from this period outside France. It includes nearly 100 pieces of art; about 500 bone and antler implements; over 200 perforated beads, teeth and shells; and the partial skeletons of at least two late Pleistocene humans



Necklace as reconstructed by Collie.

In the 1920s, the Logan Museum of Anthropology at Beloit College, Wisconsin, launched an archaeological expedition to southwestern France led by George Collie and his assistant Alonzo Pond. The expedition made substantial excavations at two important Palaeolithic sites in the Vézère Valley: Abri Cellier[1] and Rocher de la Peine. The collections, still housed at the Logan Museum, contain several thousand stone tools and many worked bone and antler tools that provide information about manufacturing processes and the chronology of the sites. Although the stratigraphic analysis on which these excavations were based does not conform to modern standards, our meagre understanding of both these sites is much enhanced by these new-found collections. For example, there are about 250 worked bone and antler objects from the Aurignacian (33,000–28,000 years ago) and Gravettian (29,000–21,000 years ago) levels of the Abri Cellier including incised bird bones that came to be known as hunting tallies, and two anthropomorphic pendants.

One of the few intact necklaces from the Magdalenian (18,000–12,000 years ago) was found at Rocher de la Peine (see figure). It is composed of three perforated bear canine teeth, one perforated and incised lion tooth, various other smaller teeth and many pierced shells from the Atlantic Coast, 150 km away. Also recovered were the complete mandible and fragmentary maxilla of an adolescent human. The original excavators thought it likely that the necklace was part of some burial furniture.

Collie and Pond purchased several large collections, the most spectacular being that of 40 engraved limestone blocks from the Magdalenian site of Limeuil, part of a larger collection of about 200 blocks recovered by Capitan and Bouyssonie in the 1920s (ref. 2). But several blocks from Capitan and Bouyssonie's collection were never published because they were indecipherable or 'poorly done'.

Clearly, the present-day collection in France is incomplete and cannot be analysed in isolation from the Logan collection. Moreover, a cursory examination of the published blocks shows that Capitan and Bouyssonie's original analysis[2] left out most of the non-animal and heavily superimposed images. In the Logan collection there are several fragments of blocks which can be pieced back together with others at the Logan Museum and at the Musée des Antiquités Nationales in Paris. An international effort to fit together the isolated limbs and heads of animals to make larger images is now under way.

Pond also purchased material from the Abri Blanchard, the richest known site for the earliest Aurignacian art and ornamentation. Surprisingly, the Logan Museum holds the 'necklace' recovered and described by Didon[3]. This necklace is a series of nearly 150 perforated antler, bone and stone beads and 5 pendants, some of them incised and decorated. The most interesting pendant was described by Didon as an ivory fish (but is probably a seal or dolphin), which has an intricately patterned series of dots drilled on its back and sides,

Growth factor A-chain back in train

As soon as the limelight of oncogenes shone on the B-chain of platelet-derived growth factor (PDGF), the A-chain was cast in such a minor role that it was in danger of being forgotten. But after starring in two recent papers, one on page 695 of this issue and one published earlier this year (*Nature* 319, 511; 1986), the A-chain is back in prominence.

That highly purified PDGF contains the two chains is undisputed. And that the chains are present as dimers is equally certain. What has not been settled is whether PDGF comprises A–B dimers or a mixture of A–A and B–B dimers, and what the contribution of each chain is to the biological activity of PDGF.

Soon after the inferred polypeptide sequence of the *sis* oncogene of simian sarcoma virus and the actual polypeptide sequence of the B-chain of PDGF turned out to be the same, there followed evidence that the B-chain-like substance secreted by cells that have been transformed by the virus mimics most, if not all, of the properties of PDGF, including its ability to stimulate fibroblasts to divide. Therefore little role seemed left for the A-chain.

Matters changed early this year when Carl-Henrik Heldin *et al.* succeeded in characterizing from an osteosarcoma cell line a substance that had the activity of PDGF yet turned out to be the A–A rather than the B–B dimer. The same group has now followed up with the DNA sequence of the precursor of the A-chain together with evidence of its expression in several tumour cell lines. These data, together with the clear demonstration that the A-chain gene is not only distinct from the B-chain gene but is on a different human chromosome, are presented in this issue (*Nature* 320, 695; 1986).

The data allow a detailed comparison of the structures of the A-and B-chains and their precursors. More interestingly, they show that the PDGF-like activity produced by most investigated tumour cell lines is probably A-chain rather than B-chain, although some cell lines transcribe both genes and perhaps secrete a mixture of the polypeptides.

This raises the question of whether the PDGF-like growth factors shown to be produced by an increasing number of normal cell types is A-chain rather than B-chain or a mixture. Indeed, as the dimers of either chain seem to have similar biological activity, why should there be two? Are there subtle differences in their activities? And is the activity of the A–B dimer different again — if, that is, it ever exists? These and related questions should soon have answers now that the A-chain and reagents for detecting it are in the hands of cell and molecular biologists.

Peter Newmark