Akhshtyr and Navalishinskaya

The article by Grichuk, Gubonina, Muratov, and Fridenberg, (1970), now available, contains original statistics, tables, and diagrams, relating to the pollen results from Akhshtyr and Navalishinskaya. Klapchuk, (1970), also now available, gives some additional information about Navalishinskaya. These results do not disagree with what is said in the SUERC volume (2005) but they will need to take centre stage in the pollen volume.

Grichuk, Gubonina, Muratov, Fridenberg

Akhshtyr

The samples were taken in 1965 from Vekilova's section of that year, which was more than 4 metres thick. The deposits were divided into three groups. The organisation of these groups is essentially the same as that summarised on page 157 of SUERC (2005), but there is a slight difference in that the layers are numbered with subscripts. It would be advantageous to use Grichuk et al. Fig. 1 (p.105) because this shows the exact position from which the samples were taken. The lithological description is as follows.

Group I.
Sharp-edged poorly cemented rubble.
1. dark brown gravel and loam. 2. sharp-edged limestone rubble, subdivided into three. 2_1 the upper part has more, less weathered, rubble [samples 1, 2, and 3]. Neolithic (but note that Figure 1 has the boundary Upper Palaeolithic/Neolithic passing through the middle of this layer, at or later than the position of sample 1). 2_2 the mid part constitutes an ash lens, and has the radiocarbon date 19,500$\pm$500 BP [sample 4]. 2_3 the lower part has more, somewhat weathered, rubble [sample 5]. Both 2_2 and 2_3 are Upper Palaeolithic. 3_1 dark brown medium loam with somewhat less large sized rubble than in the preceding layers [sample 6]. Lithologically intermediate between Groups I and II. Also said by Zamyatnin (1961) to be archaeologically intermediate between Mousterian and Upper Palaeolithic (but note that Figure 1 describes this layer as archaeologically "mixed").

Group II.
Gleyified loams, mainly light brown to greenish, with practically no large detrital material. Contacts between the layers show signs of erosion. The whole ensemble formed as a result of water action within the cave in conditions of increased dampness. Mousterian. It is accepted that the tools are in situ. This is interpreted as an indication that the site was used by people only in dry seasons as a temporary camp.
3_2 heavy brownish yellow loam with a few limestone fragments [sample 9]. 4_1 heavy slightly reddish loam [sample 11]. 4_2 medium ash-grey clay, eroded, exists only in pockets as lenses. 5_1 heavy greyish green/ochre-yellow loam, resulting from an accumulation of iron-manganese salts [sample 14]. 5_2 light brown-green clay. 6_1 medium pale rose coloured clay. 6_2 medium blue-grey clay. Both the last two exist only as lenses in erosional pockets.

Group III.
Reddish-ochre clayey deposits with many rounded pebbles, some of fine grained sandstone, some of igneous origin. Sharply distinghuised from the preceding group by a greater degree of weathering. Archaeologically sterile.
7. heavy clay, brownish-red [sample 16]. 8. light clay, greenish-yellow. 9. basal layer, brown gravely clay cemented by iron-manganese salts.

The pollen samples

16 samples, of which 6 produced nothing at all. Almost all the horizons are said to be relatively poor in pollen and spores. The figures are given in Table 1, according to the numbered samples. The left hand column is a surface sample. The first line gives the total number of pollen and spores. Line 2 = AP, line 3 = NAP, line 4 = spores. The individual identifications follow in order. The last line of NAP = indeterminate. The last line of spores = ancient redeposited forms. The %s are given in Figure 3. Note that I a and b, above and below, as well as the surface collection at the top, relate to Akhshtyr, whereas the central portion II relates to Navalishinskaya. (The diagrams relating to Akhshtyr alone are given on p.164 of SUERC (2005); the account on p. 159 of SUERC (2005) is generally congruent with what follows).

Sample 9 (layer 3_2). Dark coniferous woods, with a considerable cover of Polypodiaceae. Few AP grains (n=61) but a clear predominance of Picea and Abies. The spores of Polypodium vulgare, and the few Pinus and Betula, indicate there is a definite analogy here to the Abkhazian fir and spruce forests of today, which are at an altitude of 1200-1900 metres. The presence of Quercus and Polypodium serratum however indicates that vegetation characteristic of lower vegetation belts was not completely squeezed out.

Sample 6 (layer 3_1). Generally similar, but some % changes which are significant. Picea is reduced, Pinus is increased. NAP is also increased, including Artemisia and Compositae. Some reduction in forest cover, and increase in xerophytic elements, as shown by Carpinus and Ulmus.

There is then a considerable hiatus, corresponding to the accumulation of layer 2_3 (the absent sample 5).

Sample 4 (layer 2_2). A further continuation of the tendency already noted. There were sparse woods in the vicinity of the cave, but dark coniferous forms were definitely subordinate. The fact that deciduous AP was present suggests that the change observed was not so much connected with any lowering of vegetation belts as with an increase in dryness. This is in agreement with the observed absence of birch, which is a characteristic element of the Abkhazian subalpine belt.
Samples 1, 2, and 3 (layer 2_1) carry on the same story, even if the results are provisional due to the small numbers.

With regard to the interpretation of the results from sample 9 (layer 3_2) a lowering of vegetation belts is suggested. The present altitude of Akhshtyr is given as 200 metres above sea level (rather than the 300 metres mentioned in SUERC (2005) p.154). In view of the height of the Abkhazian forests mentioned above, it is suggested that there will have been a lowering of these belts by at least 1000 metres, if not 1200-1400

metres. The temperature gradient on the SW slopes of the Caucasus at present is 0.5° per 100 metres in the summer months and 0.9° in the winter months. If we assume that the gradient has not altered, mean July temperatures would have been lower at that time by no less than 5° and mean January temperatures by no less than 9° (more probably 7° and 12° respectively).

For the Upper Palaeolithic at Akhshtyr (and the Middle Palaeolithic at Navalishinskaya) no such calculations can be carried out, because there are no modern vegetation analogues for them in the Caucasus. No doubt, however, there was a similar climatic deterioration. It is suggested that the presence of an ash layer at Akhshtyr at this time (layer 2_2) was not accidental. The climate became less damp so the cave became suitable for occupancy, while the decrease in temperature encouraged such a move.

Navalishinskaya

The pollen samples were taken from the profile of Liubin and Shchelinskii in 1965. The limestone rubble in this section is the product of exfoliation from the walls and roof, and (unlike the situation at Akhshtyr) there is no trace of water action. A proof of this is taken to be the existence of thick well-preserved charcoal/ash layers in the section (Grichuk et al., Fig. 2, p.109). Again, it is suggested that the use of this section in the pollen volume would be desirable, since it shows the exact locations from which the samples were taken: 53-65 in layer 2, and 52-65 in layer 3. The section is generally similar to the one we already have (SUERC (2005) p.136) but it is not exactly the same. No individual description of the layers is given, so the existing description will suffice. It should be noted that on the right hand side of Figure 2 there is an indication that layer 2 = Upper Palaeolithic and layer 3 = Middle Palaeolithic, in accordance with the information that we already have.

<u>The pollen samples</u>

The results are given in Grichuk et al., Table 2. They appear in diagrammatic form as the central portion (II) of Figure 3. The organisation of the table is as for the preceding one. The last line of NAP is for indeterminate. The last line of spores is for ancient redeposited forms. Both layers indicate the presence of sparse woods and extensive cover of Polypodiaceae. So far as AP is concerned, Pinus is predominant; the dark coniferous components, Picea and Abies, play a subordinate role. They are however rather more prominent in layer 2 than in layer 3. Also present here is Cystopteris sudetica, which is now characteristic of well shaded damp woods with Abies in the upper mountain belt (determination by M.Kh. Monoszon).

The authors claim that Navalishinskaya shows a further development of the tendency noted in samples 9 and 6 at Akhshtyr. It constitutes an intermediary phase corresponding to Akhshtyr layer 2_3 (the missing sample 5) and this is why it appears as the central portion of Figure 3. Figure 3 also includes on the top line the surface sample from Akhshtyr (= the left hand column in Table 1). The sample was collected in the vicinity of the cave at a depth of 0-1 cm. It demonstrates, among other things, the effects of wind action in introducing pollen from what are now upslope coniferous woods and subalpine areas.

Navalishinskaya in Klapchuk's account (1970)

There is a short statement in the article, plus a pollen diagram (Fig. 5). [NOTE that there is a somewhat clearer and better version of Klapchuk's diagram in Chistyakov (1996) Fig. 105]. The samples were provided by Liubin, and presumably must also come from the 1965 excavation. 7 samples were obtained from layers 1 and 1a, 2, 3, 4, and 5. With one exception, the results coincide with those reported in SUERC (2005, p. 134). In fact in some cases the commentary we already have is more detailed than the one given here.

According to Klapchuk, the sequence can be divided into three complexes. Complex 1 corresponds to Layer 5. It has 85% AP almost all (99%) coniferous. This is an indication of a cold climate, similar to present montane conditions. Complex 2 corresponds to Layers 4 – 2. AP is 18-53%, mostly coniferous, but deciduous do reach up to 35%. A relatively warm climate is indicated. Complex 3 corresponds to Layers 1 and 1a. NAP is predominant (80-90%) whereas AP is restricted (10-20%). The AP consists mainly of coniferous species (65-92%) principally Pinus. NAP is dominated by Sonchus. This is an indication of a cold climate, with wide open spaces.

Contrary to what is said in SUERC (2005) there is no suggestion here that AP was zero in Layers 1 and 1a, on the grounds that the pollen grains could have been brought in from far away. Putting together the diagram and the statistics provided here and in the SUERC volume, it should be possible to establish numbers for the entire Navalishinskaya diagram. It will then be for consideration how far they agree with or complement the information in Grichuk et al. (1970) regarding Layers 2 and 3.

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