group comprises height, temperature, bare earth and the plants *Calluna vulgaris*, *Erica cinerea*, L. *Ulex minor* Roth, and *Pteridium aquilinum* (L.) Kuhn. The proportion of uncovered ground is greater on the higher, shallower, better drained and therefore drier soils and this enables the sun to heat the top soil stratum more; all four plants are well-known inhabitants of such dry heath. Of the seven variables in this group, height bare area and the plant *Erica cinerea* show greatest mutual correlation.

Highly intercorrelated sets of data like this can be simplified by compounding the variables into factors or principle components (Kendall 1957; Pearce & Holland 1960). In this case 98% of the dispersion can be accounted for by three components and the coefficients of the twelve variables on these have been tabulated (Table 2).

Table 2. *Principle component coefficients*

Variable	Code	Components		
		I	II	III
Height	1	0·304	−0·001	−0·366
Moisture	2	−0·330	−0·135	−0·111
Organic	3	−0·328	0·040	0·137
Temperature	4	0·306	−0·157	0·286
Bare	5	0·310	0·022	−0·334
Calluna vulgaris	6	0·162	0·631	0·287
Erica cinerea	7	0·311	0·109	0·038
E. tetralix	8	−0·324	−0·139	−0·181
Molinia caerulea	9	−0·334	−0·118	−0·012
Agrostis setacea	10	−0·291	0·098	0·413
Ulex minor	11	0·203	−0·289	0·590
Pteridium aquilinum	12	0·191	−0·647	0·078

The first accounts for 73% of variation and is by far the most important. The two clusters already mentioned, of wet and dry heath, have substantial negative and positive values respectively and it is clear that this component connects a set of variables that are governed by the water content of the soil. As might be expected from its well-known indifference to soil moisture, *Calluna vulgaris* has a small coefficient.

The second accounts for 13% of the dispersion and is not so easy to identify. *C. vulgaris* has, in this case, a large positive value and *Pteridium aquilinum* a large negative value (and *Ulex minor* a moderate negative value) so that the factor whatever it is, separates these two plant species widely. Unfortunately the non-biotic metrics all have small coefficients and provide no clue. However, one possibility is reasonable: plant nutrient status. *Calluna vulgaris* is notable for its ability to live in poor soils whereas *Pteridium aquilinum* and *Ulex* species are well known to be much more dependent on soil nutrients, and in fact, both are used as indicators of good soil in agriculture and forestry. As *Ulex* has root nodules that may fix nitrogen its greater dependence on soil nutrients would be expected. On the whole then a likely identity for the second component is soil nutrient status.

The third component accounts for 12% of the total dispersion. Height and bare ground both have high negative coefficients and temperature quite a large positive one, from which it appears that the factor maintains higher temperatures in low-lying dense vegetation; wind perhaps. The plants *Agrostis setacea* and *Ulex minor* which have strikingly high positive loadings are the two species confined in the British Isles to southern and eastern localities with warm summers and low wind velocities. They are in fact the characteristic associates of *Calluna vulgaris* in lowland heath. The most likely factor here