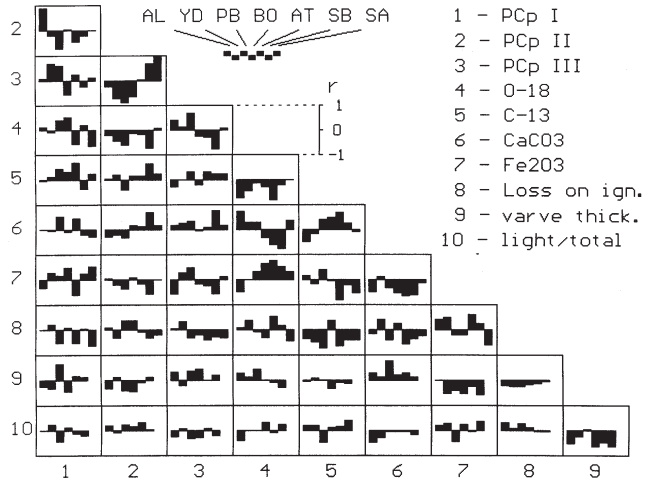

Fig. 4.5. Correlations between 10 variables calculated within the chronozones. In every box, the plot of correlation coefficients for several chronozones is given. "PCp" indicate three principal components of the palynological data. Loadings to the PCp's are given in Fig. 4.6.

The palynological data were also included. However, because of so many pollen taxa (i.e. variables) that should be included, a principal components analysis has been made. The first three principal components (PCp) were used in calculations of r. The meaning of PCp I, II, and III is given by the "loadings" obtained (Fig. 4.6). The really most important (63% of the total information) is the first PCp, with positive participation of *Alnus, Quercus, Corylus, Ulmus, Tilia, Fraxinus,* and *Carpinus* and negative of *Betula, Pinus, Juniperus,* and generally herbs. The second and third PCp's represent, as usual, not such a clear pattern. It must be mentioned that PCp-analysis has been performed for the whole profile, not separately within chronozones. Thus loadings are reflections of general correlations among taxa observed for the Late-Glacial and Holocene. Principal components are completely uncorrelated variables; it is the main feature of the analysis. However, if correlation is calculated only in a fragment of the profile, non-zero values may appear. A good example is the box 3–2 in Fig. 4.5. A surprisingly clear pattern of r's is obtained for the II and the III PCp, both of which carry only 20% of the variance. Positive correlation in SB and SA is probably produced by *Carpinus* and *Corylus*, and earlier negative correlations came from the opposite loadings to II and III PCp of *Betula, Juniperus,* and *Artemisia*. Very high positive correlation between I and II PCp in Allerød results from the lack of other taxa and from loadings of participants other than *Betula*.

A few clear patterns may be found it Fig. 4.5. The best one is connected with the relation between Fe_2O_3 (column 7) and varve thickness (row 9). The correlation is negative, with quite a high absolute value, but Allerød makes an exception, showing no dependence between variables. It should be emphasized that the interpretation of the value of r is more valid if some comparison to the other r's is possible. For example, correlation of varve thickness with loss on ignition is very small, and only the fact that it is permanently negative seems to indicate real dependence. Another interesting correlation is that of Fe_2O_3 and $\delta^{18}O$. The plot is smooth, with a significant negative correlation in Allerød and the maximum positive correlation in the Atlantic period. The correlation between the stable isotopes (row 5 – column 4) changes smoothly in time, probably also indicating real dependencies. Interesting is the diagram 6–1, i.e. the main variability of pollen data correlated with $CaCO_3$.

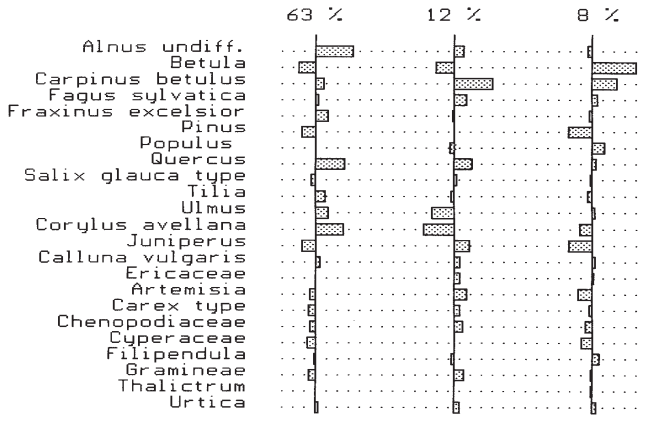

Fig. 4.6. Loadings to the first three principal components of the palynological data, according to the standard PC analysis, performed for all the samples at once (not within the chronozones). Principal components were used in the calculation of correlation coefficients; see Fig. 4.5. Percentages of the total variance carried by PC's are given.

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