PATTERN OF WOOD FORMATION IN TEMPERATE TREES
(*PINUS VIRGINIANA*)

M. P. de Silva
(*Dept. of Botany, Ruhunu University College, Matara*)

The 13C/12C isotope data of the cellulose component of the wood in annual rings could be utilised to supply information on the seasonal temperatures that prevail during the actual time of the formation of wood in the tree. Of the two main wood components *viz.* cellulose and lignin, only cellulose was investigated here.

In a slice cut through the trunk of a well grown *P. virginiana*, the annual rings of the middle portion of the stem were taken and spring, summer, autumn and winter wood were isolated out of each ring. These samples were then mixed together to form homogeneous mixtures and cellulose was extracted. The cellulose samples were burnt in a special combustion apparatus to collect the CO_2 gas. The isotope ratios of the gas samples were measured in a double forcussing spectrometer.

Trees are known to discriminate ^{13}C with increasing growth temperature. The present experiment supports the view that there is no coincidence between the period of production of sugars by photosynthesis and the actual period of ring growth. Early wood production, which is a rapid process, uses material stored in the tree when photosynthesis occurred late in the previous year and to a much lesser extent throughout the winter. In the case of the late wood, material used is that which is produced during the growing season of the same year. The best correlation with temperature was found to be as follows : For spring wood with the average temperature of the months October, November and December, for summer wood with January, February and March, for autumn wood with April, May and June and for winter wood with July, August and September.

Part of this work was carried out at the Institute of Biophysical Chemistry, Nuclear Research Centre, 5170 Juelich, West Germany.