

been retained which protect the trees from insect attack. For example, the balsam fir (Abies balsamiae) has been shown to contain an extremely active analogue of the juvenile hormone of one family of insects -- the Pyrrhocoridae -- and has thereby achieved full and complete protection from all Pyrrhocorid insects. Extracts of this terpenoid material have been found to be fully effective in human control of a number of serious Pyrrhocorid pests, such as the infamous red cotton stainers (Dysdercus sp.).

These findings direct attention to the possibility that analogues of the juvenile hormone of numerous other insect pests are to be found among the tens of thousands of terpenoid materials which a wide range of plants synthesize. Other effects of these substances may include allelopathy (above), formation of atmospheric haze and rain nuclei over coniferous forests and deserts, and alterations in soil structure.

As a first step in this direction, we recommend a conference of experts to outline a practical approach to limited aspects of the problem. This group should include not only entomologists and botanists but also experts on the chemistry of terpenes and other natural products obtained from the gymnosperms. The group could well consider a wide range of other plants and other target species.

CHANGES IN THE BIOSPHERE DUE TO HUMAN ACTIVITY

There was little or no free oxygen in the original atmosphere, and its present existence in large quantities is believed to be due in large part to the development of living organisms. At present the liberation of O_2 by plant photosynthesis tends to be nearly balanced by the removal of O_2 and production of CO_2 by animals. However, CO_2 is increasing in concentration in the atmosphere at a significant rate. This probably results in large part from combustion of fossil fuels but it may result in some degree from oxidation of soil humus or from other biological changes. The biological effects of increasing atmospheric CO_2 are not known, though it presumably stimulates some plant growth. It also affects the radiation balance of the earth and consequently the average temperature of the air and the upper layers of the ocean, but the magnitude of these possible temperature changes is unknown.

The increase of atmospheric CO_2 must be causing a slight decrease in oxygen content. Does this have any effect on the