protect and preserve such an asset for its scientific and aesthetic values, and for the benefit of future, and perhaps more appreciative, generations of Mankind.

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Some Evidence That Trees 'Communicate When in Trouble'

Preliminary findings indicate that trees which are being attacked by insects may communicate their predicament to other trees through airborne chemicals, according to a recent report to the National Science Foundation (NSF), of Washington, DC. The warning message may enable trees that have not yet been attacked to prepare defences against plant-eating insects.

If the above-mentioned findings are confirmed, they may well constitute the first demonstration that plants emit pheromones which are received and responded to by other plants, the report indicated. Pheromones are chemical substances which convey information to, and elicit responses in, other individuals. Well-known examples of this phenomenon are insect sex-attractants, but this new work could have far-reaching implications in integrated pest control programmes dealing with interactions between plants and animals.

Indications that trees communicate in this manner were reported by Professor Gordon H. Orians, Director of the Institute for Environmental Studies, University of Washington, and Dr David F. Rhoades, to the NSF's Ecology Programme which has financed their research. They informed the NSF that: 'We have gained preliminary evidence in field experiments that leaf damage of Sitka Willow *[Salix sitchensis]* by Western Tent Caterpillars *[Malacosoma californicum pluviale]* and Fall Webworms *[Hypantria cunea]* can lead to changes in nutritional quality, not only in leaves of the attacked trees, but also in those of near-by unattacked trees...This effect may be due to a defensive response in unattacked trees stimulated by volatile compounds emitted from attacked trees.'*

The general hypothesis that is being investigated in their ongoing research is that volatile chemicals, released by plants in response to damage of their leaves, can cause chemical changes in neighbouring, undamaged plants that render the undamaged plants less suitable as food for leaf-chewing insects. The research workers will use Sitka Willows in the laboratory phase of the investigation, and will try to induce changes in leaf quality of undamaged plants by confining them in chambers with damaged plants, isolating and identifying chemical emissions that may be responsible for any effects. They also will try to induce changes in leaf quality of plants, using fractions and pure compounds isolated from volatile plant emissions or obtained commercially.

'If the general hypothesis is correct', Drs Orians & Rhoades claimed, 'it is necessary that damaged plants emit volatiles which differ quantitatively or qualitatively from those emitted by undamaged plants.' Since 1979 they have been conducting field experiments designed to detect changes in the nutritional quality of trees to insects, that may have been induced by insect attack. In these experiments they placed colonies of tent caterpillars or webworms on trees and periodically monitored the biological and chemical quality of the leaves, observing lowered growth-rates and other features in trees that were being attacked by tent caterpillars as compared with unattacked control trees.

'However', they reported, 'several of our experiments gave results suggesting that both the test and unattacked control trees were changing their leaf quality in response to our placement of insects on the test trees...This implied that unattacked plants receive and respond to signals from near-by plants experiencing attack by insects. In each individual experiment the observed changes in leaf quality of control trees could have coincided with our manipulation by change, but an overall picture strongly suggestive of communication among plants gradually emerged.' They will now attempt to confirm their earlier evidence of 'plant communications'.

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Moratorium on Ocean Dumping of Radioactive Waste Agreed to in London

Whether or not *any* radioactive waste should be dumped into the ocean was the major focus of the seventh consultative meeting of the parties to the London Dumping Convention, held in London, 14–18 February 1983. Considerable discussion focused on two proposed amendments, one introduced by two Pacific island nations (Kiribatu and Nauru) which would place all radioactive waste immediately on the black-listed Annex 1, and a second resolution, introduced by the Nordic nations, which would allow for a phase-out period of such dumping until 1990. It was agreed to table both these resolutions, in order to allow a scientific and technical review to be conducted.

What was finally adopted, by 19 votes to 6 with 5 abstentions, was a fall-back resolution, introduced by Spain, which called upon all nations to cease dumping immediately. Voting against were Japan, the Netherlands, South Africa, Switzerland, UK, and US; abstaining were Brazil, France, Federal Republic of Germany, Greece, and USSR.

The resolution also requested that a scientific review of the proposed amendments and other considerations relevant to radioactive-waste dumping be reviewed during the next two years. At the ninth consultative meeting, to be held in 1985, the question of whether to amend the Convention and its annexes to prohibit radioactive-waste dumping will be considered. While not legally binding, the strong majority which supported the

* In writing to give us the scientific names of the above-mentioned organisms, Professor Orians added (*in litt.* June 1983): 'The experiments were designed and executed by Dr David Rhoades of my laboratory, and he is preparing the results for publication... At a somewhat later date, a more general survey of this and related research might appropriately find its way into your Journal.'—Ed.