

The analysis of cellular and antigenic requirements for the induction of T^K responses was a major issue of investigation, although theoretical discussions failed to deal with the question in detail. G. Shearer (National Institutes of Health) presented data to show that macrophage depletion of the responding and TNP-derivatised stimulating cells abrogated the anti-TNP T^K response. While allogeneic macrophages could restore the response, they did not affect the specificity of restriction. This is in contrast to the proliferative responses which required H-2I compatible macrophages that have been TNP-coupled. P. Doherty (Wistar Clinic) described an intricate though elegant experiment to test whether T^K induction required H-2I compatible antigen presentation. In outline, the experiment involved removing H-2^k reactive cells from H-2^b TDL by negative selection in F_1 hosts then adoptively immunising the TDL in K^k , I^k , D^b irradiated and vaccinia-infected hosts. A good K^b vaccinia response was obtained arguing that the induction of T^K could not require the participation of H-2I^k (incompatible) vaccinia antigen complexes. In a quick assay around the table, nobody could produce any evidence that H-2I-restricted T cells were required in the induction of H-2K/D-restricted T^K , although there seemed to be ample evidence that H-2I-incompatible radiation chimaeras of the H-2^a→H-2^d type were essentially unable to mount a successful T^K response. Taking this in conjunction with the observation of high levels of expression of H-2IA antigens on the thymic epithelium, many people were led to wonder if IA has some crucial role in T-cell differentiation rather than being simply the restricting antigen for helper T cells as is popularly believed. □

New evidence for an explosion in galaxy M82

from Geoffrey A. Cottrell

A SUFFICIENTLY violent explosion deep in the nucleus of a galaxy can expel hot gas right out of the galaxy. If such an explosion occurs in the centre of a disk galaxy, the ejection is most likely to take place in two oppositely directed and symmetrical beams, channelled along the rotation axis of the galaxy. This theory can be tested by making spectroscopic observations of the Doppler shifted line radiation emitted by the outflowing gas, from which one

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Accelerated soil erosion

from A. J. Low

THE loss of soil by erosion induced by man's activities is now a serious and increasing problem. More land is brought into cultivation every year to support a growing population, but the overall loss from erosion is greater than the gain. A Workshop on the assessment of erosion in Europe and the USA was held recently in Ghent.*

The urgent need today is for an assessment of soil erosion on a world scale. The extent of soil erosion can be predicted by applying the Universal Soil Loss Equation (USLE) which takes into account the erosivity of the rain and the erodibility of the soil. The rainfall factor is normally the most difficult to obtain and this has limited its use to countries like the USA. H. M. J. Arnoldus of FAO submitted to the Workshop an index he has devised providing a rapid approximation of the rainfall factor which could greatly speed up the production of small scale maps in developing countries.

A vivid account of soil erosion control measures in China today was given by R. Dudal (FAO, Rome). For centuries China has suffered from severe soil erosion with consequent silting of the rivers leading to disastrous floods. In China (as elsewhere) establishment of forests in the denuded landscape, particularly in the

watersheds is the major method for reducing erosion, with grassland where forestry is not possible. Forestry and agriculture are closely integrated in China today. The Chinese are attempting to reduce erosion tolerances to zero by reducing slopes and levelling land on a vast scale mostly by hand labour. In the USA soil loss tolerance has been set at about 5 ton/acre/year but there is little economic incentive to attain this and it is frequently ignored. The Chinese with 22% of the world's population and 7% of the world's agricultural land regard the soil as a vital resource to be husbanded at all cost.

In Europe France occupies the first rank in agriculture. But due to excessive deforestation, and intensive cropping, particularly through hasty land unification and unsuitable farming techniques, soil erosion has been accelerated and river flow regimes altered, leading to severe flooding. The key to slowing down erosion is the protection of watersheds by afforestation leading to regularisation of mountain torrents. Such measures are now standard practice in France where particular attention is being paid to fragile morpho-climatic zones.

By and large we know how to reduce soil erosion: the problem is how to implement or enforce the necessary procedures. □

* Held on 27 February—3 March at the University of Ghent. The Proceedings will be published by John Wiley.

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can deduce the large scale motions of the gas. Essential to the explosion model is the occurrence of a purely radial outflow; it is over this key feature that the controversy about whether a gigantic explosion has arisen in the nearby peculiar galaxy M82 has hinged.

Fifteen years ago, Lynds and Sandage observed, in M82, a filamentary structure which extends above and below the plane of the galaxy, revealing a radial velocity gradient which suggested that matter was being expelled from the nucleus along the minor axes with peak velocities of the order of 1,000 km s⁻¹. However, some later observations showed that the narrow (~10 Å) H α line and the continuum emission from the filaments were highly (~30%) polarised. This indicated that the radiation from the filaments was not intrinsic, but was more likely to be

radiation from a bright nucleus, scattered by dust grains above and below the plane of M82. If the grains were moving purely radially away from the central source, as required by the explosion model, then the scattered light should be redshifted on both sides of the plane. But the observations showed that the H α was redshifted on the north side of M82 and blueshifted on the south, thus creating serious difficulties for the model. In a paper by Solinger *et al.* (*Astrophys. J.* **211**, 707; 1977), the explosion hypothesis was discarded in favour of an interaction model—namely that M82 is moving through an intergalactic dust cloud in the M81 group, and is thereby sweeping up gas which is triggering star formation in the galactic disk. In this model, the red and blue shifts are explainable by a motion (in the plane of the sky) of the source of scattered