

IN BRIEF

Reactor action

Research and technology ministers from France and Germany discussed plans for the joint development of fast breeder and high temperature reactors at last week's intergovernmental meeting in Nice. Both countries are concerned about rising costs, but their research programmes also complement one another well; moreover plans broke down recently for German cooperation with Britain, whose apparent isolation is beginning to show in the face of co-operation on fast breeders between Germany, Belgium, Luxembourg and the Netherlands.

BNFL setback?

British Nuclear Fuels Ltd (BNFL), still waiting to close the controversial deal to reprocess spent Japanese nuclear fuel at Windscale, is investigating a potentially embarrassing incident there. Last week, radioactive liquid containing tritium, an element capable of diffusing through apparently impermeable materials, seeped into a stainless steel

pipe carrying cooling water through a storage tank that contains reprocessed material. BNFL claim that no radioactivity escaped from the tank.

Safeguards draft

A draft resolution from Britain to fellow members of the International Atomic Energy Agency (IAEA) in Vienna calls for an extension of nuclear safeguards agreements and will, if accepted, come before the IAEA board of governors when it meets next week. Existing safeguards, administered by the IAEA primarily to prevent the clandestine diversion of nuclear materials to military use, apply only to signatories of the Non-Proliferation Treaty; opposition can be expected from non-signatories India and Brazil.

NASA study

A major study released by the National Aeronautics and Space Administration (NASA) says that during the next 25 years space research and development

should be directed more toward Earth-oriented programmes, such as environmental monitoring and weather prediction. The study, conducted by a committee of top NASA officials and outside consultants, may form the basis for much of NASA's planning in the next few years; it recommends that space research should focus more on fundamental problems, such as the evolution of the universe and the nature of black holes, that there should be a major increase in emphasis on data management, and that the USA should develop a permanent space station.

Privacy

The Data Protection Committee, envisaged in the recent UK White Paper on Computers and Privacy as a first step towards a Data Protection Authority, is to be presided over by Sir Kenneth Younger. It was the Younger Committee's report on privacy in 1972 which first recommended an independent review body to oversee the gathering of personal information.

To obtain support for any piece of research today, it is almost essential to claim that one objective is to produce a model. This use of the word in scientific circles is relatively new. Until recently the Shorter Oxford Dictionary restricted its definition to cover such conceptions as small replicas (like Dinky toys) and to describe those persons who posed for artists and photographers, or who displayed *haute couture* garments to society ladies. The date 1971 is given when it included "a simplified or idealised description of a system, situation or process often in mathematical terms, devised to facilitate calculations and predictions" to the Addenda printed at the end of the second volume.

Provided they are correctly used, some models are clearly useful. One of the earliest was Professor Jay Forrester's world model devised for the long-term study of global problems. Provided it was fed with the correct material, it performed admirably. Unfortunately it could easily be misused, as is often indicated in that egregious publication "Limits to Growth". For instance, it is assumed that there is always an increase in environmental pollution if industrial production increases, and so a growth economy must always lead to intolerable pollution and disaster. There are many arguments against uncontrolled economic growth, but this is probably the least valid. Then it is assumed that DDT levels in fish and fish-eating

birds will rise for many years even after the use of DDT ceases. Fortunately it has been found, in several regions, that almost as soon as the

Mistaken models

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use of the insecticide is curtailed, levels in fish-eating birds start to fall. These, however, are misuses of what is clearly a true model, and one that can frequently be useful.

My real complaint is that the word model is so often abused. Many so-called models are no more than descriptions—some could best be described as "maps". We even find a written or spoken description called a "verbal model", though not by me,

nor in any publication for which I have any editorial responsibility. Then there is the mathematical model. I read that "in order that it (a hypothesis) can be tested numerically it has to be stated in mathematical terms: this is what is called a 'model' ". Again, not by me. This so-called model is surely nothing but a mathematical description, with all its faults and advantages. I resent the assumption that this is the only way in which to test a hypothesis. Some of us find a mathematical description, no matter how crude (and such a description can only be an approximation to the truth) illuminates the subject, and gives intellectual satisfaction. Others, and I believe they may be just as good scientists, find such treatment merely confusing. The danger today is that the mathematicians, and even the pseudo-mathematicians, may be gaining in influence, and trying to make others adopt methods which may not be the only ones needed to solve all our problems. All descriptions, mathematical, verbal or conceptual, are inaccurate simplifications of the truth, and can never be a substitute for accurate observation.

Recently model has taken on another meaning. Doorbells in the sleazier parts of London are often labelled simply "Model". Some are more descriptive, as "Second Floor, Lulu, Parisian Model, Very Athletic". This does seem a fruitful field for scientific research.