ENVIRONMENT

Agent Orange study rejected

The quest for a resolution of the Agent Orange issue has suffered yet another setback: The proposed design for a study to determine once and for all whether that herbicide harmed U. S. servicemen recently was rejected.

Agent Orange — which contains the highly toxic contaminant dioxin — was used in Vietnam to destroy crops in an attempt to reveal enemy jungle hiding places. Since then, thousands of veterans have attributed a multitude of health problems — ranging from fatigue and nervousness to various cancers and birth defects in their offspring — to exposure to the herbicide. Because these veterans have filed more than 10,500 disability claims, the Veterans Administration last spring contracted a research team at the University of California in Los Angeles to design an epidemiological study to investigate their complaints (SN: 5/23/81, p. 325).

The first draft of the design — submitted last August by UCLA's Gary Spivey and Roger Detels — recently was rejected by Office of Technology Assessment reviewers who want more detail and question whether the proposed study objectives can be accomplished in a double-blinded fashion. Spivey and Detels have 35 days to revise the design.

VDTs and the fetus—cause for concern?

Four reported "clusters" of miscarriages and birth defects are baffling epidemiologists in the United States and Canada. To date, the only apparent factor linking affected parties is their use of video display terminals (VDTs), according to an extensive report in the November MICROWAVE NEWS.

The best known incident involves a group of VDT operators at the Toronto Star. For the year ending in May 1980, four of the seven children born to women in the group exhibited birth defects. In Marietta, Ga., a high miscarriage rate — seven in 15 pregnancies — characterized a cluster at the Defense Logistics Agency regional office from October 1979 to October 1980. Although the remaining pregnancies went full term, three involved severe birth defects. At a Sears, Roebuck and Co. Dallas office, seven of 12 pregnancies among employees ended in miscarriage during the period May 1979 to June 1980. An eighth infant — born prematurely — also died. The most recent confirmed cluster occurred over a two-year span ending this past February: Seven of 13 pregnancies among Air Canada's Montreal-airport check-in employees ended in miscarriage.

The Centers for Disease Control say the three clusters they investigated — at Sears, the DLA office and the Toronto newspaper — can be chalked up to chance. The fourth, involving Air Canada workers, has been dismissed by Canadian health officials as warranting study. Both the Canadian and U. S. governments have given VDTs what amounts to a clean bill of health after conducting surveys into potential adverse health effects.

But many unions, particularly in Canada, are less sanguine. MICROWAVE NEWS cites recent labor agreements with three Canadian firms, including Bell Canada, which now offer pregnant women the right to refuse VDT work. Canada's airline-employees union wants similar alternate-work provisions for its pregnant employees and tests to monitor any nonionizing-radiation emissions by users' VDTs. And investigation of the Toronto Star incident continues.

How significant are these clusters? Nancy Binkin, an epidemiologist and CDC's chief investigator in Dallas, told MICROWAVE NEWS that "with 7 million women of reproductive age, we would expect to see — on the basis of chance alone — several clusters similar to the one reported at Sears." Her team considers the role of VDTs in the Dallas case "unlikely" because risks did not correlate with proximity to, or time at, the machines.

PHYSICAL SCIENCES

Damping neutrino oscillations

Will neutrino oscillations be one of those things in physics that start out by making a big splash and then gradually vibrate away? Oscillation is the ability of a neutrino to change its identity in a cyclic way among two or more of the three known varieties: electron neutrino, muon neutrino or tau neutrino.

Physicists had believed that a neutrino born as one of the three varieties retained that identity as long as it existed. For reasons that looked good in theory some theorists predicted neutrino oscillations, however. Then an experiment done at the Savannah River Nuclear Reactor in South Carolina showed evidence for oscillations (SN: 5/10/80, p. 292), and the rush was on. Later a similar experiment done at the Institut Laue-Langevin in Grenoble, France, did not show evidence for oscillations.

Now there is another negative. This experiment was done at the Fermi National Accelerator Laboratory in Batavia, Ill., by 21 physicists from Brookhaven National Laboratory and Columbia University (N.J. Baker et al.) and is reported in the Nov. 30 PHYSICAL REVIEW LETTERS. Instead of using a reactor as the source of neutrinos, these experimenters used the main neutrino line at Fermilab, the beam of neutrinos produced by striking high-energy protons from the laboratory's main accelerator against a target, which is used for all kinds of neutrino experiments. These experimenters watched at various distances down the pipe from where the neutrinos are made to see whether any muon neutrinos (the overwhelming majority of those in the beam) turn to electron or tau neutrinos. They found no such evidence.

Experimentation is likely to continue. It is impossible to prove a negative from lack of evidence. Furthermore, these are complex experiments, and many subtle arguments can be made about how exactly to intercompare their data. But what is likely to happen in the long run is that if enough different experiments don't see oscillations, people will stop looking.

A hot time in the target tonight

Laser fusion tries to bring about thermonuclear fusion by crushing and heating a tiny microballoon of fuel by hitting it from all sides with laser light. The light is supposed to cause an abrupt ablation of the surface of the target. The reaction to the ablation is supposed to implode the rest of the target, condensing and heating it to the conditions appropriate for the ignition of fusion.

The process works if the light couples correctly to the outside of the target, giving its energy mostly to the atomic nuclei there. One of the major technical questions in these experiments is whether the substance in the target and the wavelength of the light are optimum for this result.

A report on recent experiments with targets of substances of high atomic weight and light of 10.6 microns wavelength indicates that favorable conditions are not met. The report, by W. Priedhorsky, D. Lier, R. Day and D. Gerke of Los Alamos National Laboratory, appears in the Dec. 7 PHYSICAL REVIEW LETTERS. It records what are billed as the first measurements of the hard X-ray spectrum (30 to 300 kilo-electron-volts) emitted as 10.6-micron light strikes these targets. The spectrum indicates that between 10 and 100 percent of the incident energy goes to electrons in the outer layer of the target, making so-called hot electrons that "pre-heat" the target, dissipating energy needed for the implosion. This is unfortunate because 10.6 microns comes from carbon dioxide lasers, which, as lasers go, are easy to make and endow with high energy. "[The result] presents a major problem for 10.6-micron laser-fusion target design at high intensities," the experimenters write.

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