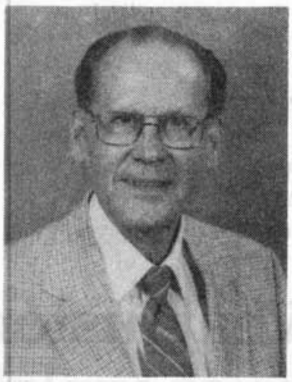
Hal Fox



The author, an engineer, was the director of the first research laboratory at the University of Utah Research Park. When Drs. Fleischmann and Pons made their announcement of the discovery of cold fusion, Fox and a group of engineers and scientists recognized the future need for commercializing the technology. Within three weeks, this group formed the Fusion Information Center, Inc., rented office space at the University of Utah Research Park, and began publishing a monthly bulletin, *Fusion Facts,* that has rapidly become the main source of public information on who is doing what in cold fusion.

Fox and others at the Center have been working on applications for the current low level of heat obtained from cold fusion cells. They have noted the following possibilities: hot water heaters for homes, apartments, and industry; generation of low-pressure steam for sanitation purposes; heating and cooling of homes, greenhouses, farm buildings, and so forth; pumping of irrigation water; desalination of brackish and salty water; water distillation systems (for obtaining potable water at sea, for example); sewage treatment systems; heating systems for chemical processing (such as in oil refineries); food processing systems (cooking); food drying or dehydration systems; frost prevention systems for orchards; and snow removal systems—permanently installed in sidewalks and roads.

By coupling fusion energy reactors to systems for the conversion of heat energy to mechanical or electrical energy, many more applications are feasible. For example: small power plants for rural or recreational use; direct thermoelectric conversion systems; power systems (probably with batteries) for small automobiles; emergency power systems; power systems for remote operations (such as mining); and power systems for manufacturing plants.

The cost for fusion power systems may be relatively high, Fox says. However, the cost of fuel (the deuterium in heavy water) is currently about 1¢ for the energy equivalent of a gallon of fuel oil or gasoline. This is the key factor driving the intense interest in fusion energy systems.

Appleby, et al. report an experiment in which sodium deuteroxide is used to replace lithium deuteroxide in a fusion cell (while it is producing measurable excess heat). The results are very low (but above zero) excess heat. When the lithium deuteroxide is restored, the cell regains its production of excess heat.

Experiments are needed in which it is determined if lithium is involved in a nuclear reaction or whether lithium acts as a catalyst. The theorists will need this type of specific information to help in the development of a comprehensive theory.

Neutron and tritium branching. In high-energy nuclear physics, the nuclear reactions (1) and (2) above have been observed to occur with about equal frequency. Although Oppenheimer[12] discussed the branching problem in 1935, there are many highly trained scientists who expect to find equal branching of the two nuclear reactions in the low-energy palladium lattice. (Note the quotation in the first paragraph.)

Many of the scientists who have successfully replicated the Fleischmann-Pons Effect have found that equal branching of the two deuterium reactions was not observed. In fact, experiments have demonstrated that it is much easier to build a working-fusion cell that produces tritium than to obtain neutrons.

References 4, 5, and 7 all report the unexpected results that tritium production exceeds neutron production.

Tritium is found in volcano gases. The theory of cold fusion should explain the fact that tritium is found in gases from volcanoes.[6]

No reports of helium in palladium lattice. Further experimental verification will be required. However, at the present, there are no known papers in which helium-3 or helium-4 has been found to be present in the palladium lattice or in the fusion cell electrolyte in sufficient amounts to be compelling evidence of fusion byproducts. One case has been reported (Bockris in a speech given at the University of Utah) in which the level of tritium first rose and then almost exponentially decreased.

It has been suggested (Collins, personal communication) that the helium gases that may be formed from one or more nuclear reactions are being rapidly scavenged by other, as yet unreported, nuclear reactions. This may be the reason for the reduction of tritium in at least one experiment.

Bursts of short- or long-term heat. Bursts of heat have been observed by many investigators, including Fleischmann et al.[4], Iyengar,[7] Oriani,[8], and Wadsworth.[13] These bursts of