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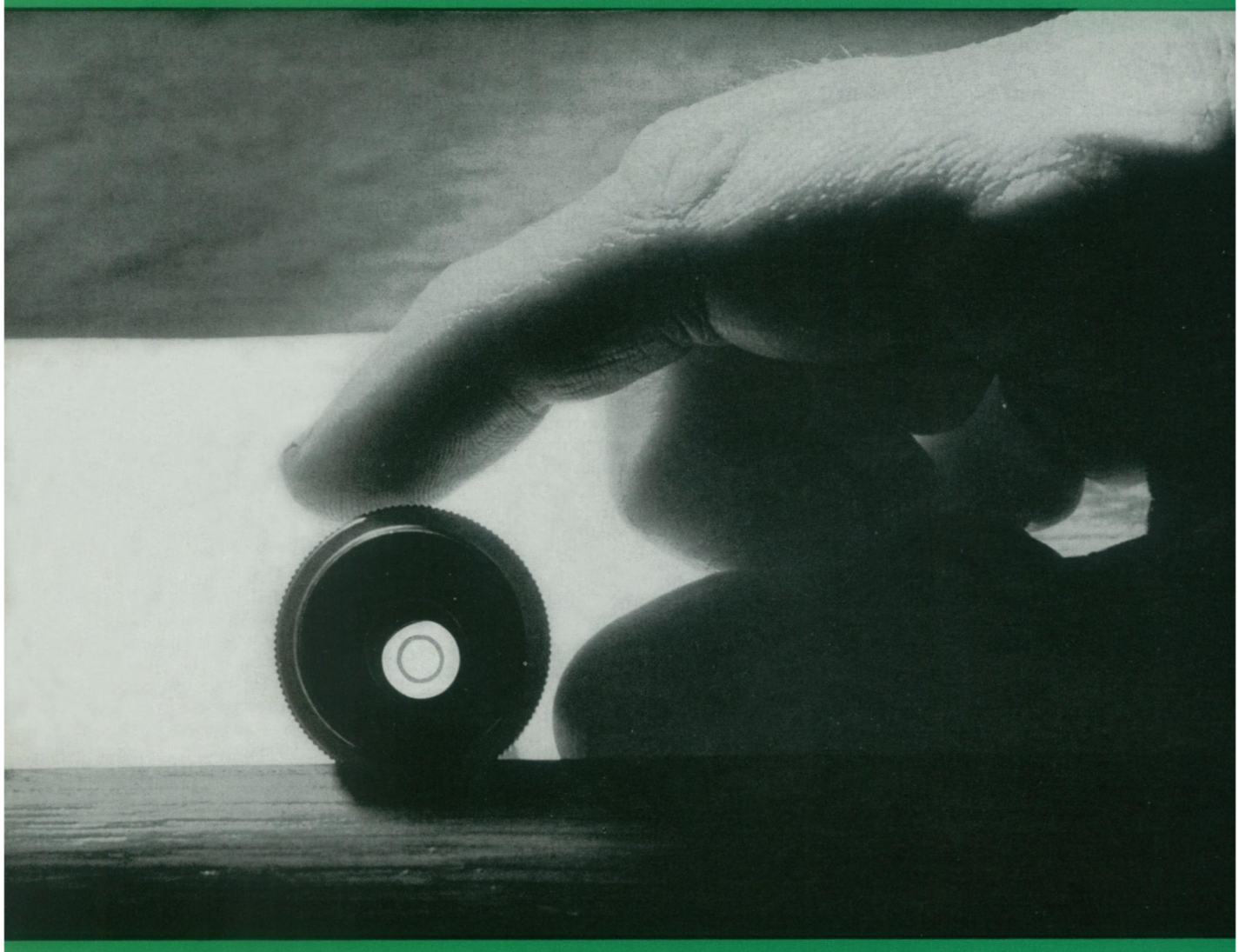

Prize-Winning Ring

See Page 307

A SCIENCE SERVICE PUBLICATION

What General Electric people are saying . . .

L. TONKS

Dr. Tonks is Manager—Physics Section—Knolls Atomic Power Laboratory

For several years we have been operating a reactor which is serving not as a prototype or a direct source of power-reactor performance information but as an auxiliary in such a program—much as a cathode ray tube can be useful in testing television sets. We had experienced the limitations of a Ra-Be source in a graphite pile and foresaw that an experimental thermal reactor could serve as a very valuable tool. Purely as a substitute for the graphite pile, it could easily give us many more neutrons even at low power. Thus, activation experiments either for weighing absorbing foils or fuel itself could be carried out more rapidly. It became reasonable to think that with sufficient intensity and using a chopper we might make actual differential cross-section measurements, and a certain type of exponential experiment in fissionable material became a possibility. Finally, the criticality condition in a reactor makes it suitable for neutron absorption measurements by observing the effect of the material under test on reactivity.

These were the considerations that led us to build our first thermal test reactor based on the fundamental design of Dr. Steward of this Laboratory . . .

Our thermal test reactor has undergone a logical evolution in accordance with its proved usefulness. From a small beginning with a power level of one watt, all-manual controls, makeshift shielding and borrowed fuel, it has justified development into the 10,000-times-more powerful reactor we are about to complete. It is still small as reactors go and yet can give thermal neutron fluxes for experimental purposes which are comparable with far larger units. And by exploiting danger coefficient techniques it can measure thermal capture cross sections of small samples and weigh isotopes.

at the American Physical Society, Rochester, N. Y.

E. J. LAWTON

Mr. Lawton is with X-Ray Research, Electron Physics Research Department, General Electric Research Laboratory

We have recently found that certain polymers, or plastic materials are cross-linked or "cured" when bombarded with high-velocity electrons. This curing process cross-links, or ties together, the long chain-like molecules that make up the plastic material. Some of the properties of this cross-linked material are greater form stability at high temperatures and improved solvent resistance. For example, consider polyethylene bottles or containers (squeeze bottles). These, as you might expect, will collapse if subjected to high temperatures. A short time electron bombardment of such a bottle, however, will change its characteristics so much that it can stand up under steam sterilization. You can start an almost endless list of applications with sterile but unbreakable containers for pharmaceutical and biological materials which require sterilization after packaging. Unbreakable, re-usable milk bottles can be another possible use. Other plastic materials that can be cross-linked by the electron beam are nylon, rubber, and silicone products.

In some of our earlier work we found that certain liquid materials would polymerize to solid plastics when exposed to the electron beam. In this process, there is a joining together of many smaller molecules to form the long chain-like molecules that make up the solid plastic. This means of initiating polymerization does not necessitate the use of catalyst and high temperature that is required in the conventional chemical polymerization process. In fact, we found that polymerization could be initiated at temperatures as low as about 100° Fahrenheit below zero. Further, by controlling the pattern of the electron beam, it was found that specific solid plastic shapes could be produced in the liquid, thus providing a new and interesting way of casting objects.

General Electric Science Forum WGY, Schenectady, N. Y.

C. A. BURKHARD

Dr. Burkhard is a Research Associate at the General Electric Research Laboratory.

When one desires to find information concerning a field or particular compound he is confronted with the problem of consulting abstract journals, books or files to find the data which he desires. It is possible by use of either hand-sort or machine-cards and equipment to prepare technical libraries which will have available files of information pertaining to the entire field of science. Then one confronted with the task of making a survey of a given field could consult such a library, and, by making the proper sorts by hand or by machine, obtain (1) a list of references pertaining to the subject in question (2) obtain pertinent data concerning the subject. As an ultimate in this type of activity it would be possible with the machine sort cards to rapidly prepare printed sheets of references, lists of compounds and their physical properties, or lists of materials having certain physical properties. By the use of such type files it would also be possible to correlate and analyze data pertaining to particular research and development problems from time to time without requiring the necessity of using research personnel to conduct such surveys.

at the American Chemical Society Chicago, Ill.

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