

A MAJOR BREAKTHROUGH IN ULTRA-MICROTOMY

INSTANT TOTAL ARREST OF THERMAL ADVANCE *at touch of button...*

EXCLUSIVELY WITH THE



ULTRAMICROTOME "OM U2"

ADVANTAGES:

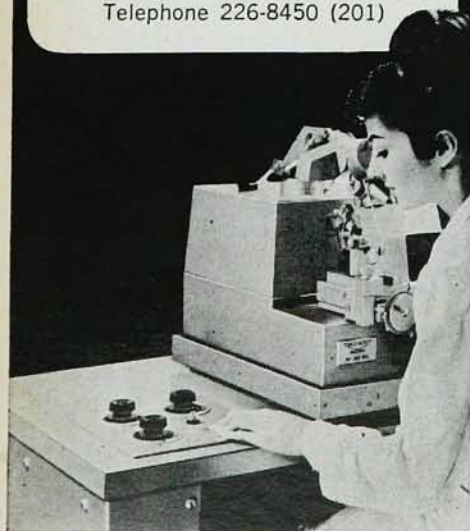
Instant total arrest of thermal advance eliminates time-consuming repositioning of knife and specimen and combines accuracy of thermal advance with advantages of precision mechanical feed. You merely "dial" for automatic continuous ultra-thin serial sections. Knife and specimen holders adjust to any position—glass and diamond knives accommodated.

The cutting speed is infinitely variable between 0.5 and 5 mm/sec., and the whole installation is entirely vibration-free.

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of Los Alamos Scientific Laboratory, who acted on a suggestion made by Brian D. Josephson of the University of Illinois.

To measure chemical potential, μ_f , along the path of the film, several different devices were built; one such beaker arrangement is shown in the figure. Superfluid helium flows over the beaker rim, where the liquid level is z_i inside the beaker and z_o outside. The side tube has much smaller radius than that of the beaker, so adjustments of the liquid level z_i in the tube by film flow occur much faster than changes in z_i and z_o . The chemical potentials per atom of the bulk liquids inside and outside, μ_i and μ_o , are related to the gravitational head by $\mu_i - \mu_o = mg(z_i - z_o)$. This difference in chemical potentials provides the driving force for film flow. Keller and Hammel, taking advantage of several new theoretical developments, find that z_i measures μ_f (relative to μ_i or μ_o) at the tube orifice.

With this simple level-sensing technique, Keller and Hammel measure height as a function of time and then plot profiles of chemical potential along the flow path, inside and outside the beaker. Measuring inflows ($z_i < z_o$) and outflows ($z_i > z_o$) for a variety of beaker shapes, they find that dissipation in the flowing film can either occur very locally or over extended regions, depending on the experimental setup. —GBL

Franklin Institute

We recently attended the dedication of a new building to house the Franklin Institute Research Laboratories. The 105 000-square-foot facility is across the street from the institute's famous science museum, in central Philadelphia. The institute, which also performs research at the Bartol Research Foundation in nearby Swarthmore and the Center for Naval Analyses in Washington, D. C., has a professional staff of 810. The new \$5-million building houses 300 scientists and other staff.

The laboratories' chemistry division has been working in the chemistry and physics of organic solids, polymerization, quantum chemistry and ways of desalinizing ocean water. Projects in the materials science division include:

identifying and characterizing structure, purifying and fabricating materials, and studying specific properties and the effect of structure on these properties. Three years ago institute scientists made very pure single crystals of beryllium and were interested to find that unlike the usual brittle metal, these were quite ductile. Last year they found that semiconducting lead telluride has a superconducting transition at about 5°K, a much more convenient temperature for device applications than had previously been found with semiconductors.

At the annual Franklin Institute Medal Day ceremony held later the same day (19 October), medals were given (see PHYSICS TODAY, November, page 95) for such diverse activities as research in polymers (Herman F. Mark), radiation shielding (Everitt P. Blizard, posthumously) and development of monolithic circuits (Jack S. Kilby and Robert N. Noyce). The institute's highest honor, the Franklin Medal, went to Britton Chance, of the University of Pennsylvania.

Synchrotron for Smithsonian

The world's first high-energy synchrotron is being moved from the University of California campus at Berkeley to the Smithsonian Institution's Museum of Science and Technology in Washington, D.C., where it will form an exhibit in the new Hall of Nuclear Science. The machine, which first operated in 1948, has been shut down since 1960.

Construction of the synchrotron began in 1945 not long after Edwin M. McMillan, now director of the Lawrence Radiation Laboratory, and the late Vladimir I. Veksler independently put forth the theory of phase stability, which made synchronous particle accelerators possible. On 16 December 1948 it yielded its first beam of 340-MeV electrons.

One of the machine's historic investigations was on photoproduction of mesons, which led ultimately to the discovery of the neutral pi meson, the first particle to be discovered by accelerator techniques. Theory had suggested that sufficiently energetic gamma rays might generate mesons. The Berkeley synchrotron was the first ac-

celerator capable of producing the proper gammas, and it was put to the work in 1950 by a team that included Wolfgang K. H. Panofsky and Jack Steinberger.

The synchrotron was shut down when the laboratory program had shifted largely to the 6.2-GeV Bevatron. Its transfer elsewhere for research purposes was uneconomical so it has remained in storage at Berkeley.

The Smithsonian exhibit will take several months to set up. The accelerating chamber, vacuum pumps, oscillators, platforms, auxiliary experimental tables and samples of the magnet are being packaged and sent to Washington. The magnet will not form part of the display. At 135 tons it is too heavy for the exhibit floor so its presence will be simulated by a wooden or fiberglass mock-up.

Solid state at Argonne

Argonne National Laboratory will construct a new building for solid-state research according to a recent announcement. Scheduled for completion in the summer of 1968 the new building will contain 36 laboratories with offices, conference rooms and other facilities in about 105 000 square feet of space. Argonne's solid-state staff numbers about 125, whose work is now temporarily housed in "congested" areas in five other buildings.

Hydromechanics projects sought

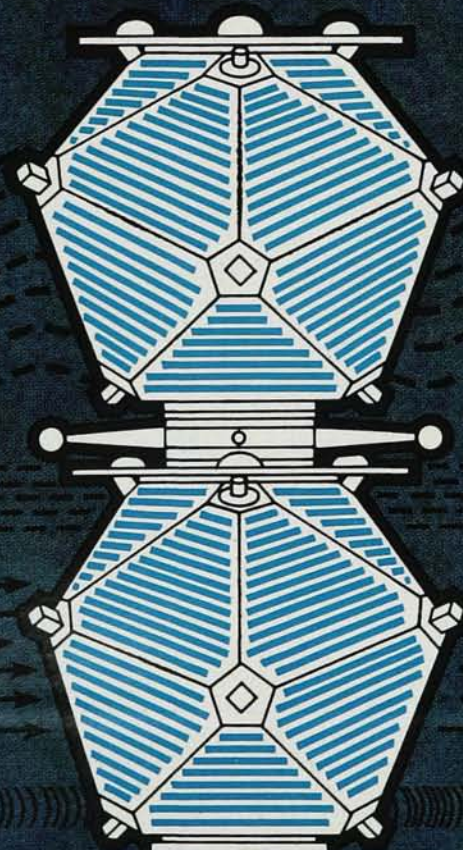
The David Taylor Model Basin is seeking proposals for contract research in hydromechanics. Annual contracts are awarded to support work that is of interest to the navy. Although the program is technically administered by the David Taylor Model Basin, contractors work in their own laboratories, not at David Taylor. The program of projects to be supported will be made up early in the year, and proposals must be sent in by 15 March. Proposals should be submitted to the Commanding Officer and Director, David Taylor Model Basin, Code 513, Washington, D.C. 20007. Inquiries regarding the program and the format for proposals should be addressed to Stuart F. Crump or Raymond E. Converse Jr., Code 513. □

Bits and people

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