consist of other phosphatides and fatty substances. Thus patients must consume large quantities of the commercial preparations to receive therapeutic doses of pure lecithin. These daily doses of commercial lecithin often contain as many as 700 calories.

Another problem with commercially available lecithins is that their content varies from manufacturer to manufacturer, and so researchers cannot be sure what patients are ingesting in addition to pure lecithin. Lecithin manufacturers met with the conference participants, however, and agreed to make prepara-

Speaking of Science

Prospects for Proprietary Synchrotron Radiation Research

From the point of view of industrial researchers, the price of doing experiments at federally supported facilities, but at no expense to the government, has often been too high to pay: loss of some patent rights and a requirement to publish results in the open literature. Precedents for proprietary or secret research exists in the form of, for example, the use of neutron beams from the reactors at Oak Ridge and Brookhaven National Laboratories by companies wishing to irradiate materials of commercial significance. But the popularity of synchrotron radiation and the imminent availability of new federally funded sychrotron radiation facilities are exerting pressure for a more permanent and widely acceptable policy. Some steps toward development of such a policy have recently been taken or are under consideration.

One of these is an agreement that was worked out this summer by the Monsanto Company and Stanford University and allows company researchers to carry out x-ray studies of proprietary catalyst materials at the Stanford Synchrotron Radiation Laboratory (SSRL). Thrashing out an agreement was made more than ordinarily difficult by the complex three-way set of interests at SSRL. Stanford, seeing itself as an educational institution, required in the strongest terms that all research there be published; the National Science Foundation (NSF), which supports the operation of SSRL, lacked a firm policy on proprietary research there because the issue was not one the agency has had to face previously; and the Department of Energy (DOE), which finances the source of SSRL's photons, the SPEAR electron-positron storage ring, a facility used primarily by high-energy physicists, had a regulation governing rights to patentable inventions deriving from work at its facilities. Further adding to the complications was the large demand for access to SSRL's x-ray beam lines, so that the scientific merit of any proposed proprietary work had to be sufficient to grant it priority over other researchers' proposals, according to Arthur Bienenstock, SSRL director.

Resolution of the application by Monsanto researchers Robert Friedman and B. Ray Stults to use SSRL was achieved when: (i) the company did, in fact, submit a proposal with competitive scientific merit; (ii) the company agreed to publication of results within 1 year of completion of the experiments, enough time to reap benefits from the knowledge gained ahead of competitors; and (iii) the company and Stanford agreed to a formula whereby SSRL would recover the costs of providing x-rays to Monsanto. In addition, in order to provide a means whereby the merit of the company's proposal could be judged without disclosing its proprietary aspects, a confidential third party, in this case Bienenstock himself, who would receive and hold the proprietary data, was designated.

Brookhaven will have, in late 1981, two storage rings that, unlike Stanford's SPEAR, are dedicated entirely to the production of synchrotron radiation. According to Martin Blume of Brookhaven, officials there and within DOE, which is funding the new National Synchrotron Light Source, are working hard to develop a policy for proprietary research, in part because numerous inquiries have already been received. Blume notes that at least three categories of users from profit-making organizations can be envisaged: those wanting to do purely basic research, those who, like the Monsanto investigators, want to do research involving proprietary materials or techniques, and those wanting to use synchrotron radiation in the conduct of their business. An example of the latter might be a company offering x-ray fluorescence analyses of samples submitted by its customers. Each prospective class of users brings up different issues, none of which are settled yet, although two elements of any final policy apparently will be that Brookhaven will not offer any services that could be construed as competing with those available from private facilities and that full cost recovery for proprietary research will be required.

Brookhaven has also issued a call offering guaranteed access to synchrotron radiation for nonproprietary, basic research to institutions or groups that develop instrumentation for one of the new beam lines. It has not yet been decided whether companies would be extended this opportunity, although instrumenting a beam line is such a major undertaking that only the largest firms would likely be up to the task.

Manufacturers of microelectronic circuits may, in the end, be the ones forcing a resolution of the problem of proprietary research. One of the avenues being investigated in the drive toward further miniaturization of these devices is the use of x-rays, to replace the 4000-angstrom light now used, in the photolithographic process by which the circuit patterns are delineated. But, at present, only the high intensity x-ray beams from synchrotron radiation sources are strong enough to make x-ray lithography practical. SSRL, which is slated to have exclusive use of SPEAR on a half-time basis by the end of next year and which is in the process of constructing new facilities, now has under consideration a plan whereby those interested in x-ray lithography could use one of the new beam lines for proprietary research. The new wrinkle is that access would be outside the competitive proposal process, and therefore, says SSRL's Bienenstock, because the slow evaluation step would be bypassed, access would be on a much more timely basis. Eventual publication of research results and full recovery of operating costs would continue to be required, however.—ARTHUR L. ROBINSON

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