

Many experts think the real future of biosensors lies with field effect transistors (FETs), which marry semiconductors to organic material, such as an enzyme, that creates electrical potentials. FETs are significant because they can sense the chemicals involved in a reaction directly, rather than monitoring their presence indirectly by measuring side effects such as temperature changes. FETs have been around since 1971, but Lowe warns that significant work on them has yet to be done.

Lowe's work is being funded by the Science and Engineering Research Council, a government agency that underwrites academic research and tries to marry that research to industrial applications. The biotechnology directorate at SERC is awarding Lowe

a third of a million pounds, the largest amount it has given to any one group. The total budget of the two year old directorate is between one and two million pounds.

The head of the directorate, Geoffrey Potter, thinks biosensors merit special attention, in part because they could lead to development of new small companies like the one Higgins is founding. The directorate would also like to see biosensor research flourish in at least one British academic center. He reckons that "encouraging the further coming-together of biology and electronics" will be an important part of his activity. He also hopes it will help boost British exploitation of what he thinks are "a lot of techniques looking for application."  
—Laura Mazur

guard," states Gerald D. Watt, a Kettering Laboratory investigator. "After the initial jolt, I think that everyone is settling down to a fairly positive attitude. Many researchers are taking a wait-and-see approach."

Battelle is funded mostly by contract research, and the Kettering Laboratory scientists are apprehensive about whether their research will be modified by the new management. Adelman claims Battelle would make no abrupt alterations. "The principal change would be that we would seek to apply the good basic research that the people at Kettering are doing," he says, adding that Kettering researchers would also benefit from access to Battelle equipment and scientists.

"I don't think that the research will change a whole lot," states Baker. "The Battelle Institute is interested in the kinds of work we are doing." However, Baker previously has done applied research for Weyerhaeuser, and his current work on symbiotic nitrogen fixation in woody shrubs and trees can also be considered applied. Baker notes one drawback to contract research: scientists are less able to discuss their work with others, and if the contract specifies it, publishing can be delayed.

Watt, in contrast, is doing basic research on nitrogenase. Eventually, he says, his work may inform genetic engineers of the constraints of cloning the gene into other organisms, but the returns on his research will be realized only in the long term. Watt currently is holding discussions with Battelle over the future of his research. If his research is funded, he says, he can continue, but otherwise the research may be in jeopardy.

Wolfgang D. Bauer, a senior investigator, is one of the few Kettering scientists who already has an industrial research contract. In addition to basic research grants from the National Science Foundation, the United States Department of Agriculture, and the Department of Energy, Bauer does applied work on nitrogen fixation for Agrigenetics, Denver, CO. However, he is also apprehensive about the management switch; he emphasizes the importance of basic research. In addition, he foresees problems with the Agrigenetics contract because it gives him a share of future patent royalties. This arrangement is contrary to Battelle policy.

All parties agree that any modifications in research direction will be gradual. They also say it is too early to determine what these changes will be; the changes will not be apparent for at least a year. However, Adelman says, "our goal would be to have a self-sustaining laboratory at the end of five years."  
—Arthur Klausner

**FOUNDATION DE-EMPHASIZES SCIENCE**

**BATTELLE TO ACQUIRE KETTERING LABS**



The Kettering Lab, which Battelle is acquiring.

YELLOW SPRINGS, Ohio—The Charles F. Kettering Research Laboratory here will probably be acquired by the Battelle Memorial Institute, Columbus, OH. At the request of the Charles F. Kettering Foundation, which funds the laboratory and numerous other projects, Battelle made a proposal in July outlining terms for the takeover. The laboratory specializes in basic nitrogen fixation and photosynthesis research, but the change in management could refocus the work toward more applied areas of biotechnology.

If the organizations reach agreement, Battelle will operate the laboratory with some funding from the Foundation for a fixed length of time (perhaps five years), after which Battelle will purchase the facilities outright and the Kettering Foundation will maintain control of its \$95 million endowment, according to Albert H.

Adelman, Battelle's Associate Director of Research. He foresees no major obstacles to the agreement. The Kettering Foundation was unwilling to increase funding to the laboratory as expenses rose, Adelman reports, so it asked Battelle to draft an acquisition proposal. The Foundation now funds the laboratory at the rate of \$1.6 million per year, with the rest of the laboratory's \$2.1 million budget coming from outside sources.

"The Kettering Foundation in its long term forecast sees itself not being able to provide the financial background that the laboratory needs if it is to continue as a growing institution," says Dwight D. Baker, a staff scientist at the Kettering Laboratory. Other researchers believe the action is a final move by the foundation's board to de-emphasize science.

"The idea descended on us rather quickly and caught everyone off