with osteopathic hospitals in surrounding cities for clinical education. (There are still many unresolved questions about the interactions between the two medical schools at MSU; these will be discussed in a final article.)

It should be noted that medical education at MSU will not necessarily prove less expensive than the more common big-university-medical-center model. Certainly the expense of a major teaching hospital will be saved at MSU, but the operating costs in a community-based system of administration, deployment of faculty, and student travel may well counterbalance the saving.

The ultimate question, of course, is what kind of doctors MSU will produce. So far, graduates have fared well in moving on to other medical schools (when MSU had a 2-year school) and in gaining acceptance in good internship and residency programs. But the question of whether or not MSU medical graduates will stay in Michigan and improve the condition of health care must await some years for an answer. At MSU, however, there seems to be a genuine feeling that the prognosis is good for both the partnership between the medical schools and the communities and, in the longer term, for MSU's alternative style of medical education.

—JOHN WALSH

APPOINTMENTS

Charles A. Payne, professor of chemistry, Morehead State University, to dean, School of Sciences and Mathematics at the university. . . . **Charles D. Michener**, professor of systematics, ecology, and entomology, University of Kansas, to chairman, entomology department at the university. . . . **Donald R. Progulske**, head, fisheries and wildlife department, South Dakota State University, to head, forestry and wildlife management department, University of Massachusetts. . . . **Cyrus Mayshark**, associate dean, College of Education, University of Tennessee, Knoxville, to dean, School of Education, University of Texas, El Paso. . . . **Louis S. Harris**, professor of pharmacology, University of North Carolina, to chairman, pharmacology department, Virginia Commonwealth University. . . . **Martin W. Donner**, acting director, radiology department, Johns Hopkins University School of Medicine, appointed director of the department. . . . **Kenneth J. Ryan**, chairman, obstetrics and gynecology department, University of California, San Diego, School of Medicine, to head, obstetrics and gynecology department, Harvard University. . . . **Raymond R. Walsh**, professor of physiology, Southern Illinois University at Edwardsville, School of Dental Medicine, to chairman, biology department, St. Louis University. . . . **Stephen E. Fienberg**, assistant professor of statistics and theoretical biology, University of Chicago, to chairman, applied statistics department, University of Minnesota. . . . **Lewis J. Sherman**, professor of psychology, University of Missouri, St. Louis, to chairman, psychology department at the university. . . . **Gordon E. Stone**, associate professor of anatomy, University of Colorado, to chairman of biological sciences, University of Denver. . . . **Orlando F. Gabriele**, professor of medicine, University of North Carolina, to chairman, radiology department, West Virginia University. . . . **Earl W. Collard**, associate professor of dentistry, University of California, Los Angeles, to chairman, operative dentistry department, University of Oklahoma. . . . **Maurice Bender**, former chief, research and training, grants branch, division of air pollution, Public Health Service, to director, Arctic Health Research Center, Alaska. . . . **Warren F. Jones**, dean of administration, University of Louisville, to dean, School of Arts and Sciences, Georgia Southern College.

RESEARCH NEWS

Magnetic Containment Fusion: What Are the Prospects?

Very early in the atomic age it was realized that the reaction that produces the hydrogen bomb could be a great source of energy if it could only be controlled. At one time it was thought that the research on a fusion reactor might proceed so quickly that it would possibly be an alternative to the first generation of fission reactors of the breeder type, but the early projections were too optimstic. No one knew in the early 1950's how slow progress toward a fusion reactor would be because few scientists realized that it would be necessary to unravel and master the details of a whole new field of science—plasma physics—first. Scores of different shapes for magnetic systems have been tested to see how well they would contain a fusion reaction. But so far none has shown that net production of energy is feasible.

As a result of rather encouraging experiments in the last 4 years, many scientists now think that controlled fusion is probably attainable with magnetic containment systems, possibly about 1980. Some scientists have estimated that an alternate approach to fusion—with a laser to heat the fuel—might be feasible sooner (*Science*, 29 September 1972). If the scientific feasibility of either magnetic or laser fusion were demonstrated, commercial sales of fusion reactors would still not begin until after experimental reactors were extensively tested and a demonstration reactor proved successful. The specific studies necessary to begin to assess the size, cost, operating characteristics, radioactive hazards, and environmental effects of a fusion reactor are in a very early stage for laser fusion and are just becoming available for magnetic fusion. However, it is clear that fusion reactors would have two great advantages: virtually unlimited fuel resources and no conceivable danger of an explosive accident.

Two heavy isotopes of hydrogen are commonly considered as the likely fuels for fusion: deuterium and tritium. Deuterium is so plentiful in seawater that it would be an extremely cheap fuel (costing only 0.003 mill per kilowatt hour); but tritium would have to be bred in a fusion reactor, much like plutonium can be bred in a fission reactor. The temperature for burning a mixture of deuterium and tritium is so high that no material could contain the fuel without melting. But magnetic fields shaped like bottles can keep the hot fuel from touching any walls.