

SPECIAL ISSUE:

LASERS THEN AND NOW

With this special issue on lasers, we celebrate the completion of the Laser History Project, an effort begun in 1982. The project was founded by four societies—The American Physical Society, the IEEE Lasers and Electro-Optics Society, the Laser Institute of America and the Optical Society of America.

Because authoritative history depends on adequate documentation, the project's first job was to tape oral-history interviews with laser pioneers and to solicit memoirs and biographical and bibliographical material from other prominent laser scientists, engineers and business leaders. The project director, Joan Lisa Bromberg, conducted 50 interviews. Project historian Robert W. Seidel conducted an additional 25 classified interviews. The unclassified interviews were transcribed mainly by the AIP Center for History of Physics, but some were done by the IEEE Center for the History of Electrical Engineering, AT&T Bell Laboratories and the United Technology Archives. The classified interviews were transcribed by the Office of Naval Research and the Air Force Weapons Laboratory; the transcripts are now being reviewed for declassification. The transcripts, together with about 75 memoirs collected by the project, will be deposited as the Laser History Archives at the AIP Niels Bohr Library, the Archives of the University of Illinois and the Bancroft Library of the University of California at Berkeley.

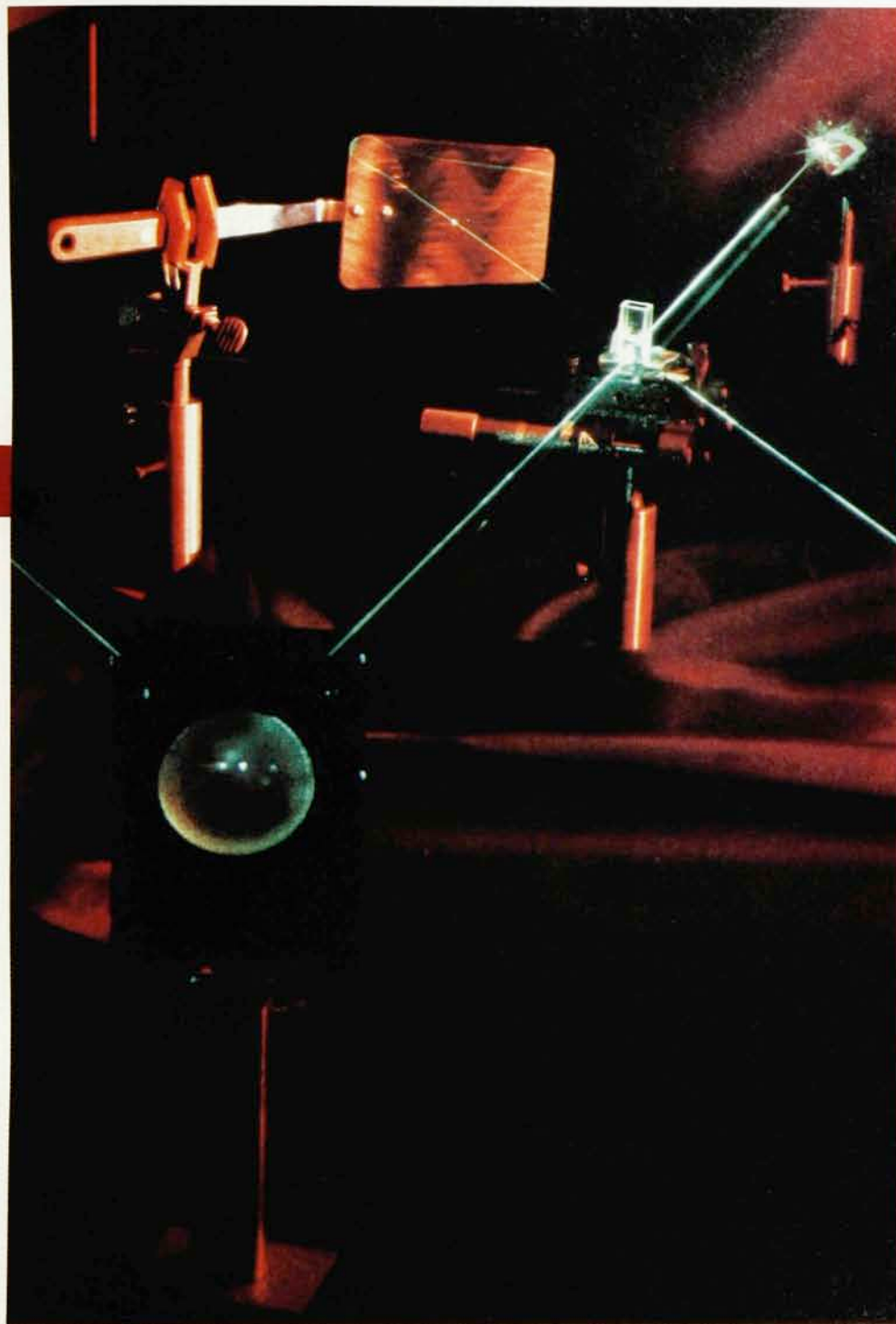
The project was supported financially by the sponsoring societies, government agencies, public and private foundations and business firms. Arthur H. Guenther

served as chair of an advisory committee of distinguished laser scientists and historians.

Project members of course recognized that laser progress results from an international effort, but as Bromberg notes, "the resources we could raise could only stretch to developments in the United States." Advisory committee chairman Guenther took advantage of a trip to the Soviet Union to obtain interviews with Nicolai G. Basov and Alexander M. Prokhorov for the Archives collection. The AIP Center for History of Physics is preparing a catalog of the holdings of the Laser History Archives and of other source material held elsewhere.

The project's second major task was to produce historical writings to give scholars a framework for further research on the evolution of laser science and the laser industry and to provide teachers with information to use in lectures, textbooks and popular talks.

Two articles in this special issue are examples of the project's output: Bromberg's article "The Birth of the Laser," which begins on page 26, describes the long birth process from the time in September 1957 when Charles H. Townes first wrote into his notebook his preliminary ideas for an optical maser until the end of December 1960, when the first continuous laser was operated at Bell Labs. Seidel's article "How the Military Responded to the Laser," (starting on page 36) covers the early laser period and shows how the military supported most of the research and development on the laser. He says that the military suggested many of the laser's applications and



Finding and tracking a shiny object. Here a phase-conjugating mirror and a pancake turner form a resonator. The phase-conjugating mirror, which can have gain because it is externally pumped, finds and directs a laser beam to the urensil's shiny surface. Such experiments are described in Jack Feinberg's article beginning on page 46. (Photo courtesy of Feinberg.)

was also the principal customer for lasers.

Bromberg and Seidel are now completing a book, *The Laser in America*, under contract to the MIT Press. The epilogue to the book, on the recent past and near future of the laser, is being written by Guenther, Henry Kressel and William F. Krupke.

The remaining two articles in this special issue deal with currently exciting topics in lasers. "Photorefractive Nonlinear Optics," by Jack Feinberg (beginning on page 46), describes the highly nonlinear response that converts photorefractive crystals into self-pumped phase-conjugat-

ing mirrors that can unscramble a scrambled image.

Thomas F. Deutsch, whose article "Medical Applications of Lasers" begins on page 56, reveals how the therapeutic use of lasers is growing increasingly sophisticated as laser technology advances and more is learned about the interaction of laser light with living tissue. Lasers are being used to reshape corneas, pulverize gallstones, ream arteries and destroy tumors.

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