

# SCHOOL OF HOLOGRAPHY

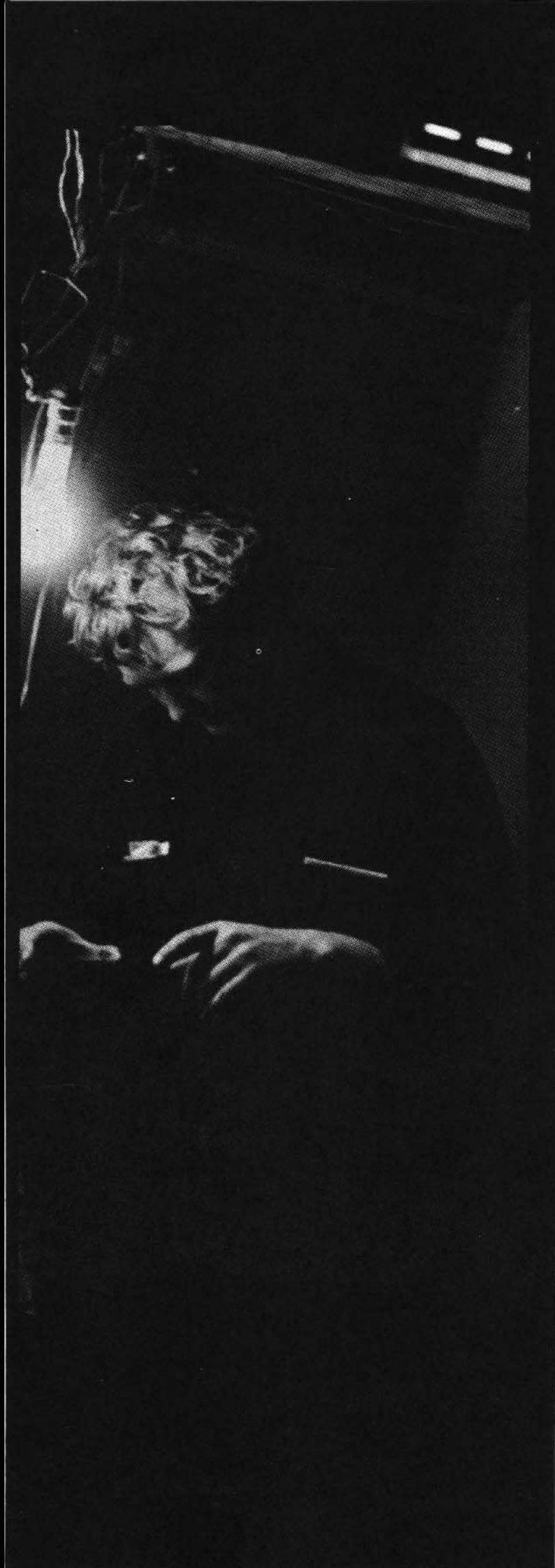
by Thomas Albright

The School of Holography was established in the fall of 1971. It was set up to make information about holography (three dimensional laser photography) available to the general public and to develop holography as a visual medium. The major activities of the school in the coming year will be the offering of basic and advanced classes in holography, workshops, and the publication of a journal of holography. Initial facilities of the school include four complete holographic studios and associated equipment, including lasers, optics, viewing areas, and darkroom facilities, as well as a permanent exhibit of current work in holography, including holograms by major artists. Also available are information booklets, notes, and bibliography on the subject of holography.

The converted warehouse at 454 Shotwell Street is the world's first and only known holography school. Its founder, and head is a young physicist-turned-holographer named Lloyd Cross. Its senior faculty member is a young artist-turned-holographer, Jerry Pethick. The school functions on three simultaneous, but distinct, levels. Its main business is teaching the fundamentals of holography to beginning students, 130 of whom have already completed the \$85 eight-week course in basic holography to become competent holographers. The course carries credit at a number of local colleges.

"The history of holography is only ten years old, and the laser has only been around for twelve. We're about where photography was in the 1860's," Cross pointed out. "But today it takes only months or years for what used to require decades. Developments are going to be very fast."

At its simplest, the making of a small 4 by 5 inch hologram requires a two milliwatt continuous wave laser (cost: about \$150), a few lenses, a film or photographic plate, and a solid foundation under everything that will prevent any kind of movement of the apparatus while the hologram is being made; the accidental motion that will cause a blur in conventional photography will make a hologram virtually unreadable. Cross and Pethick have solved this problem by the simple expedient of setting up platforms that are covered with several hundred pounds of sand and concrete, and rest on a pedestal of inner tubes; the sand can also be used to stand objects in so they stay solid. The school is equipped with four such set-ups, each in its own darkroom, as holograms of this simple, "transmission" type must also be made in total darkness. "The whole room is a camera," Cross explained.



"While a photograph duplicates what the eye does, holography parallels what the mind does," Cross said. "Latest theories about the brain indicate that memory is not localized in any one spot, but is spread all through the brain. This means that information is stored in the brain exactly the way it is stored in holograms."

For all its magic, holography at this simplest level is handicapped by a number of more or less serious obstacles, solutions to which are the the goal of continual experimentation. Among the most severe drawbacks is holography's present limitation largely to inanimate subjects of relatively small size — bottles, glasses, dolls, and so on — that can be easily illuminated within a darkened room.

Cross and Pethick are now working on a complex system whereby an outdoor landscape or similar panoramic vista will be photographed on a roll of 35 millimeter slides that will pan horizontally across the scene to record the same image from a sequence of 36 different angles, down to intervals only one tenth of an inch apart — in effect, a kind of extended stereo. Each color slide will then be made into a hologram, and the 36 individual images can then be superimposed above one another to produce a master hologram that will recreate the panorama in depth.

Another area of experimentation is color. Thus far, holography has been almost exclusively monochromatic, meaning black and a kind of eerie red-orange (the color of ordinary laser light), which mixes together to form a peculiar granularity — visually fascinating in its own right, but not very realistic.

However, Cross has also just installed a newly acquired, \$10,000 krypton laser that emits four colors all on the same beam. "By combining, we can recreate 95 per cent of all natural colors — compared to the 75 percent capacity of color TV," he said. "Very little has been done in color, because there is not much technological application. Some two color experiments have been done. We'll begin with two, and work on from there."

Somewhat more distant prospects include holographic movies, and Pethick says "three-dimensional television is also a certainty at some time, but whether it will be purely a holographic process is still open to conjecture." He has himself created an animated holographic film (the world's first); a holographic movie, however, must await development.

"When people are able to take a hologram home and use it, the impact will be tremendous — on the environment, on design, and even on architecture," Cross said. "Holography can create the future," said Pethick. "Using holography, the physical environment can be anything that man can conceive." Holograms on a skyscraper's window glass — not obscuring the inside view — might create huge pictures for people outside. Or, since visual reality could be created without physical restraint, Cross thinks a building lobby could be converted into an illusion of a tropical paradise.

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Sand table at School of Holography.

