

"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.

