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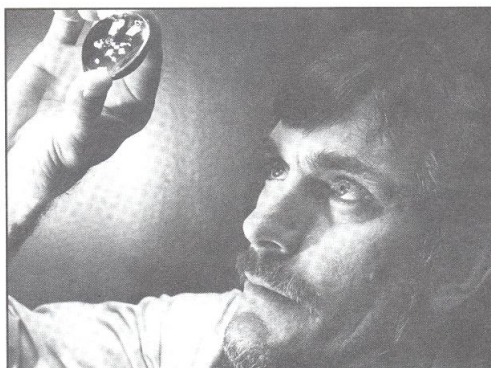
A NEW TOOL IN OPTICAL MEASUREMENT TECHNIQUES

An inspection system using a panoramic annular lens could soon revolutionize optical measurement techniques used to examine the inner surfaces of sewer lines, pipes in nuclear power plants and eventually cavities within the human body.

The panoramic annular lens (PAL) is a single piece of glass with spherical surfaces that produces a flat annular image of 360 degrees. An inspection system incorporating a PAL would be superior to other television systems currently used to view inner cavities, because of its ability to view at 360 degrees with little or no distortion, according to researchers at UAH.

The system would use projected light within a cavity. The images would be recorded through the lens using a digitizing camera and computer system.

Dr. John Gilbert is leading an international research team that continues to improve the technique. The team includes Dr. Pal Greguss, a professor in the Applied Biophysics Lab at Techni-



Dr. John Gilbert studies the PAL, a new panoramic annular lens.

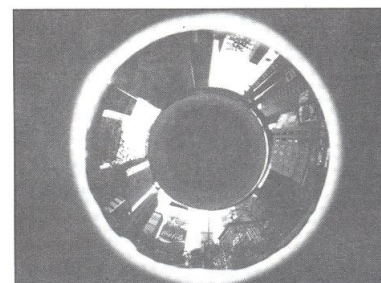
cal University in Budapest, Hungary and Dr. Donald Matthys, a physics professor at Marquette University.

The team has been able to produce a lens with a diameter of six millimeters. This small lens was used in a prototype to demonstrate the potential for making a variety of optical measurements within different cavities. The work was funded through a contract with the propulsion division of NASA's Marshall Space Flight Center in Huntsville.

The lens was initially developed by Greguss. Inspection systems devel-

oped by the research team will be marketed through the Huntsville-based company, Optechnology. Dr. Gilbert is the company's president.

According to Gilbert, a PAL system could locate and show the size of



A new view on the world — a look through the panoramic annular lens.

hairline cracks, the position of offset joints and deterioration in concrete pipe. It could also identify corrosion caused by chemical deposits or cracks caused by thermal or mechanical stresses common within nuclear power plant piping. The PAL could also be used in biomedical applications to contour internal organs and arteries.

Gilbert and the team plan to produce a working prototype for automated inspection by April 1991. ■