

Mock Circulatory System Developed at PSU

Engineers at Penn State have developed a new mock circulatory system to evaluate artificial hearts before they are implanted in animals.

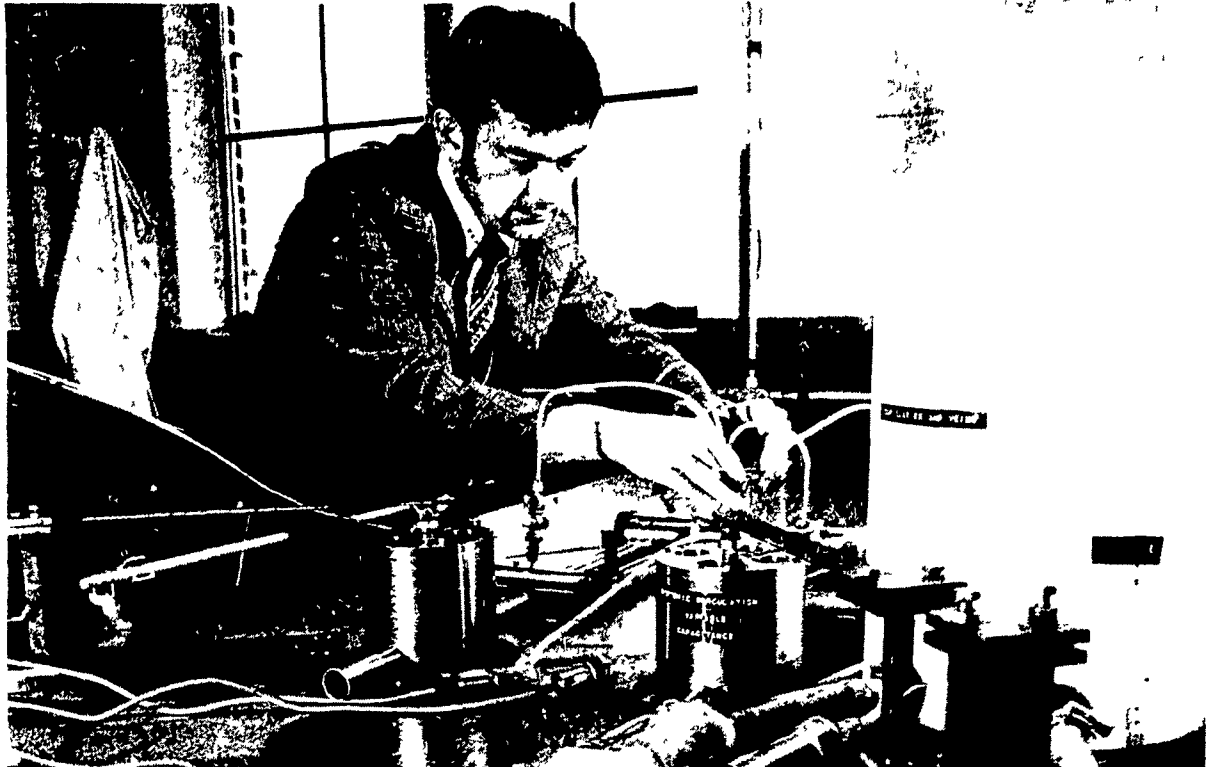
It uses hardware—pistons, flat steel plates, plastic tubes, etc.—to simulate the conditions present in the animal's body. And it circulates a thick clear fluid instead of blood.

Dr. John Brighton, associate professor of mechanical engineering, will report on the new system at a symposium of the Japan Society of Mechanical

Engineers in Tokyo this September and at the Joint Automatic Controls Conference at Stanford University in August.

The work is part of a twelve-man project aimed at the development of an artificial heart being conducted in cooperation with Penn State's Hershey Medical Center. Principal investigator there is Dr. William S. Pierce, a specialist in cardiac surgery.

Plastic artificial hearts fabricated at Hershey must be tested prior to implant in



Dr. John Brighton demonstrates the Penn State mock circulatory system designed by him to test artificial hearts (lower foreground) before implantation.

Unique feature is piston, which expands and contracts to store blood in imitation of the aorta in the body.

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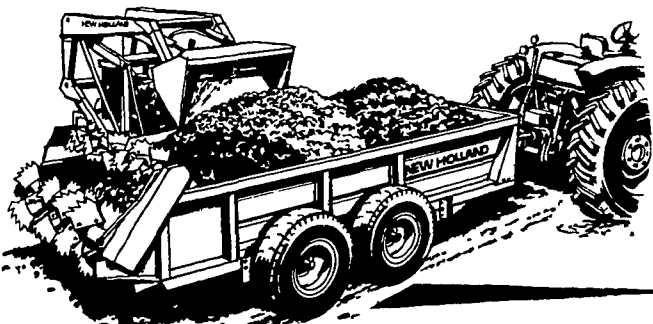
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animals. They must be coupled to a mock circulatory system so their performance—in terms of the delivery of blood—can be evaluated.

Systems currently in use by heart-development researchers, according to Dr. Brighton, "are either too complex and inconvenient to operate or so simple that they do not

adequately simulate the physiological conditions."

Dr. Brighton, Dr. W. M. Phillips and graduate student Gus Rosenberg designed and built the new system with partial support from the Pennsylvania Science and Engineering Foundation.

Some twenty pairs of ventricles—the heart's pumps—

being made at Hershey will be tested on the new apparatus before being implanted in calves.

The Penn State mock circulatory system sits on top of a small table in Dr. Brighton's laboratory.

A clear fluid having the same viscosity as blood is pumped through the system by plastic ventricles whose beat rate is maintained pneumatically by air or other gas under pressure.

A key feature of the Penn State system is its pistons, which represent the aortal chambers near the heart.

"The aorta's variable
(Continued On Page 30)

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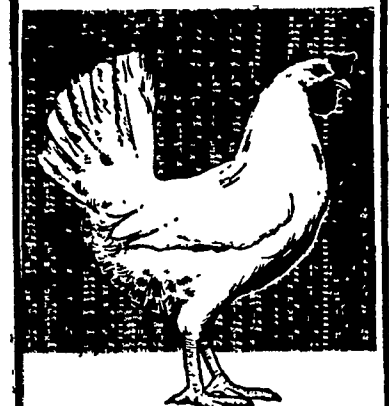
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