SURGERY

Monkey Lungs for Babies

Artificial heart-lung apparatus uses monkey lungs instead of mechanical means for putting oxygen into the blood during operation for heart-defect.

➤ MONKEY LUNGS may be the future means of saving babies born with the most hopeless form of heart defect.

The monkey lung is part of an artificial heart-lung apparatus that is designed to keep these babies alive while surgeons operate to repair the heart defect. That apparatus, designed by Campbell Cowan, engineer of the Banting Best Institute, Toronto, Canada, was shown at a meeting of the American Medical Association in Chicago by Drs. W. T. Mustard, A. L. Chute and A. Sirek of the University of Toronto.

Other heart-lung machines use a mechanical heart to pump blood and a mechanical lung to put oxygen into the blood. In the one shown at the meeting, the pumping feature is mechanical but the monkey lung does the important job of putting oxygen into the blood. In this way it is much closer to the natural way in which oxygen is put into the blood.

The new heart-lung machine has so far been tried on eight babies. Five of them were doomed to die within the first few days or weeks of their lives because the big blood vessels from their hearts were reversed in position. The one that should have been on the right side of the heart was on the left, and the left one was on the right side of the heart. As a result, all the blood was kept circulating through the body without ever reaching the lungs to get fresh oxygen.

Every year about 1,000 babies in the United States and 100 in Canada are born with this hopeless defect, although they are otherwise perfectly normal. The hope of the Canadian scientists is that with the artificial heart and lung apparatus, the babies can be kept alive long enough for surgeons to operate and transpose the big blood vessels back into the normal position.

None of the eight babies on which the machine was used survived. This, however, was not because of any fault of the machine. The babies were just too sick to survive. Three of them had a very severe form of the tetralogy of Fallot, the "blue baby" condition for which the first of these heart operations was devised.

The new heart-lung machine with the monkey lung in it was able to keep blood circulating through the babies' bodies for from five minutes to four hours. In two cases, the surgeons were able to complete the operation. One child survived 24 hours. In the other of these two cases, the two big blood vessels were of such different size that it was not possible to transpose them and sew them into the new position. The end of one would not have fit the stump of the other. This baby, however, who had been on the heart-lung circuit for 10 minutes with his own heart completely bypassed, survived for 14 days.

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METALLURGY

Improve Process for Aluminum Coating Steel

➤ AN IMPROVED process of coating steel and other ferrous metals with aluminum, revealed by General Motors, not only protects the base metals from rusting but also makes the coated product a heat-resistant material.

This means that its use may conserve a number of strategic alloys now needed in high temperature applications.

The process, developed by Alfred L. Boegehold and assistants at the GM Research Laboratories in Detroit, is said by the scientists to be a simple, practical and inexpensive method for producing an aluminum base alloy coating over ferrous metals of high quality.

Known as "Aldip," the process can be used to coat shaped articles or, in a continuous process, for coating sheet, wire or rod stock.

The process is now in pilot plant use at a GM plant in coating heat exchangers for an auxiliary tank motor. The heat exchanger consists of two small tanks connected by a series of parallel tubes roughly similar to a miniature radiator. The exchangers may be in complex shapes but they can still be easily handled by the new process.

In the process, these heat exchangers are dipped in an alkaline cleaner, washed in hot water, run through an acid pickle, rinsed and dried in a furnace until ready for coating. Then they are dipped approximately four minutes in a bath of preheating salt at temperatures near 1,300 degrees Fahrenheit.

Next they are transferred to an aluminum bath which is covered by a half-inch layer of salt flux. About 45 seconds later they are returned, while still red hot, to the preheat salt bath and slowly raised. Inside and out they assume a silvery appearance as the coating cools.

Microscopic examination of the coating on steel reveals an outer coat of aluminum-bearing iron. A second layer, next to the steel, is an iron-aluminum alloy.

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ALUMINUM DIP BATH—The steel exhaust manifold shown here is being lifted from a molten aluminum bath that coats it with aluminum inside and out within 60 seconds. The coating resists rust and, in some cases, acts as a heat-resistant material that may conserve strategic alloys needed for defense production.