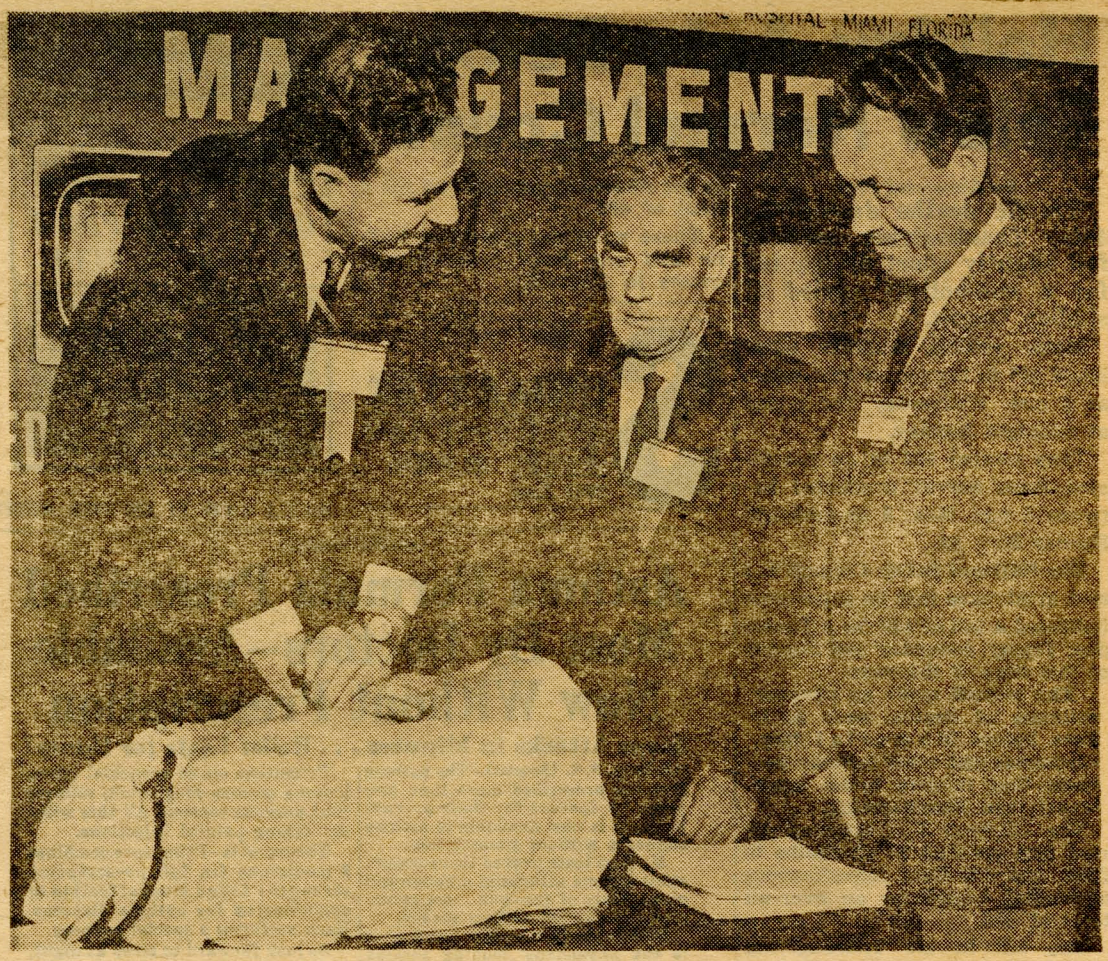

Dr. Denis Cavanaugh, left, of the Miami University Medical School, demonstrates closed chest heart message in one of the hundreds of scientific and professional exhibits now on display at City Auditorium for the 15th Clinical Session of the American Medical Assn. Looking on are Drs. James G. Thomson of Miami, center, and Stanley E. Thompson of Richmond, Tex. Using a life-sized model of the male torso made of elastic plastic, the Miami U. medical school is showing the 6000 visitors in Denver for the AMA meeting how lives can be effectively saved by pressure through the chest on a stopped heart.

—Rocky Mountain News Photo by Mel Schieltz.

Space Frontier Gives Insight to Life's Origin

Biological research stations on the "Vertical Frontier" of space can be expected to contribute understanding of the "origin of life and its evolution," the surgeon general of the U.S. Air Force forecast in Denver Monday.

Speaking to a scientific session on space medicine of the 15th Clinical Session of the American Medical Assn., Maj. Gen. O. K. Niess described the frontier of space as "a symbol of man's never-ending quest for knowledge and his innate curiosity of what lies beyond the next horizon."

Space research already has made important and fundamental contributions to earthbound medicine, Gen. Niess said, but he agreed with a colleague speaking later to the same session that there are major questions still to be answered.

Weight Big Problem

One of the big problems is the effect of prolonged weightlessness on the human body, Dr. James G. Gaume, chief of life support systems investigation for the Martin Co. in Denver, told the meeting.

Some adverse effects already have been determined and countermeasures planned.

Weightlessness in terms of seconds and minutes has been achieved in supersonic jet planes and with experimental animals in rockets such as the Aerobee, Viking and Redstone. Capt. Ivan Kincheloe was weightless for about two minutes on his record-breaking flight to 126,000 feet.

But to provide a situation of zero-G (total weightlessness) for as long as 90 minutes requires an orbiting space craft traveling at 17,000 miles per hour, Dr. Gaume said.

The Denver scientist reported that the flights of Shepard, Grissom, Gagarin and Titov "indicate that men will have little or no difficulty tolerating short term weightlessness."

Dr. Gaume

Gen. Niess

Some indications of how the body responds to weightlessness can be gained by studying persons subjected to long, inactive bed rest or to inactive suspension in water, Dr. Gaume said.

Among the adverse affects found in such studies:

Lowering of blood pressure and blood volume, loss of nitrogen from the tissues, demineralization of bone, greater excretion of calcium and phosphorous, kidney stones, decreased gastro-intestinal activity, fewer gastro-intestinal secretions, constipation, slowed metabolism, inability of the stomach to relax and empty, liver function impairment, heart palpitation, dizziness, reduced tolerance of muscular effort.

Most or all of these problems could be met, Dr. Gaume indicated, by a rigid exercise program for spacemen.

Moreover, there are also biological problems involved in the reentry of spacemen into the earth's or some other planet's gravitational field, Dr. Gaume noted.

More to Be Learned

Spacemen also will have other things to learn in addition to their rigorous muscle exercises, Dr. Gaume said. Man can learn very quickly to adapt to weightlessness in some respects by conscious use of muscles—in eating and drinking, as examples.

But he also will have to learn how to move about when weightless. Perhaps with suction cups on his shoes, or magnetic shoes, perhaps with "jet guns" in his hand. He will have "to learn how to maintain proper body position during motion to avoid tumbling" in space.