

PHYSIOLOGY

Synthetic Skin Aids Burns

A synthetic skin tested on rabbits and pigs produces few antibodies, remains moist while covering the wound and heals to the receiver's original skin color.

► A NEW SYNTHETIC SKIN may soon be used in the treatment of severe burns. The new material will probably be of greatest use in third degree burns if more than 50% of the body has been affected and skin grafts cannot be used. Current therapy gives only a one-in-four chance of survival when 60% of the body is burned.

Reported in *Chemical and Engineering News*, 43:25, 1965, the new material was developed by a colloid chemist, Dr. Heinrich Thiele of the University of Kiel, West Germany, and is being evaluated for human use by pathologist Michael Wanke and surgeon Karl-Heinz Grozinger, both with the Heidelberg Clinic. Tests done on rabbits and pigs indicate that the body's immunity apparatus will not reject the material.

Dr. Thiele began with pigskin, which is more like human skin than any other. He separated it into its two natural layers and removed most of the skin constituents from each layer, leaving only two thick solutions containing the proteins collagen and elastin. The two liquids were rebuilt into skin layers with a glue-like substance consisting of metal

ions such as copper and lead, and mucopolysaccharide acids, sugar-like molecules found naturally in skin tissue. The metal ions were replaced by hydrogen ions and the layers were fused into a product that resembled the original skin but which could be grafted successfully to foreign tissue.

The reconstituted skin combines many of the properties necessary to a successful synthetic skin. It produces very few antibodies, remains moist and flexible as the wound it protects is healing and forms a sheath to protect the wound from airborne infection. In addition, it heals to the original skin color because the skin of the receiver can grow into and replace the synthetic.

Drs. Wanke and Grozinger have tried a number of promising synthetic coverings but they found that Teflon mesh causes a foreign body reaction in the receiver's skin, polyvinylpyrrolidone powder dries and splits during healing, allowing air to reach the wound, and one-layer collagen synthetic coverings have a low antigenic level, but they are too dry and split during healing.

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PHYSIOLOGY

Birth Defects Studied

► HOPE FOR STOPPING birth defects that produce maimed babies is not an idle dream, Dr. Virginia Apgar, professor at Cornell University Medical College, New York, said.

The director of birth defect research for the National Foundation-March of Dimes is teaching the first course ever to be given in this country on teratology, which means literally the science dealing with the production, the anatomy and the classification of monsters. The word was derived from the Greek.

The pitiful deformed babies born in Germany and other countries after pregnant mothers had taken thalidomide as a tranquilizer have been studied by many scientists but no one has found out why the drug caused such tragedies.

"I have gone back to teaching pediatrics at last," Dr. Apgar said, "and my third-year medical students are getting a course on the various causes of deformities. These, of course, include German measles, or rubella, in the first three months of a pregnancy. Deformities can be caused by inheritance and environment. Sickle cell anemia, for example, is inherited, and family planning means that such parents should not have more babies."

Asked about the causes of miscarriages in women who are apparently healthy, Dr.

Apgar said 30% to 50% of them are due to an abnormal chromosome. There also is the possibility that the mother rejects a foreign tissue much as a transplanted organ is rejected. The immunity problem is being studied by many scientists in an attempt to understand it.

"It is fairly well established that thalidomide did its damage in the 26th to the 54th day of pregnancy, that is, from the date of actual conception, not cessation of menstruation," she said. "But why it caused the deformed babies, no one knows. We are trying to find out."

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PHYSIOLOGY

Membrane Role in Cell Metabolism Discussed

► WHY SOME CELLS in the stomach lining pour hydrochloric acid into the stomach and certain substances can be absorbed through skin, while others cannot, can be partially explained by the movement of atoms carrying an electric charge, or ions.

Recent progress on how ions move through the body was reported in New York by a Nobel Prize winner from Australia and by scientists from Switzerland, Denmark, France, Germany, England, the Netherlands and the United States.

Nobelist Sir John C. Eccles from the Australian National University told a conference, sponsored by the New York Academy of Sciences, how nerve signals are relayed from one nerve to another.

Dr. Aser Rothstein of the University of Rochester, Rochester, N.Y., reported research on the two different systems for transporting sugars across the cell membrane or thin film that encloses the yeast cell.

All cell membranes, Dr. Rothstein said, consist of a very thin layer of fat or fat-like substance sandwiched between two layers of protein molecules. One transporting system allows the sugar to pass through the membrane in a "downhill" direction, from higher to lower concentration. The other system, called active transport, drives the sugar in an "uphill" direction, from lesser to greater concentration.

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SURGERY

President's Gallbladder Operation Successful

► PRESIDENT LYNDON B. JOHNSON underwent successful surgery for removal of his gallbladder at the U.S. Naval Hospital, Bethesda, Md., on Oct. 8.

Performing the operation was Dr. George A. Hallenbeck of the Mayo Clinic, Rochester, Minn., assisted by four other doctors.

On removal of the gallbladder, the doctors found that it contained one stone. They also found a stone in the ureter, which they removed. The operation lasted about two hours and 15 minutes.

The President is expected to be completely recovered after about six weeks' rest.

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National Foundation-March of Dimes

OVERCOME BIRTH DEFECTS—
Dr. Andrew A. Pandazi, a urologist at the Milwaukee Children's Hospital, examines a child born with an open spine, symbolizing the quarter of a million children born each year in the United States with serious birth defects.