MEDICINE

New Rheumatism Remedy

Called "compound E" for short, the new drug is a hormone produced by the outer part of the adrenal gland. It will be some time before it is available.

➤ NEXT year some time sufferers from the kind of rheumatism called rheumatoid arthritis will begin to get help from a new drug. Only a few of the thousands of arthritis sufferers will be able to get this help even then, because of the difficulties of producing the drug. But probably enough will get it so that doctors can tell just how to use it for best results and how to avoid unpleasant side-effects if any should develop.

The new drug is a hormone produced by the outer part of the adrenal gland. Called "compound E" for short, its full scientific name is "17-hydroxy-11-dehydrocorticosterone." The tiny amounts so far available have been given to 16 patients at the Mayo Clinic in Rochester, Minn.

Each patient began to get better within a few days, Drs. Philip S. Hench, Edward C. Kendall, Charles H. Slocumb and Howard F. Polley report in the PROCEEDINGS OF THE STAFF MEETINGS OF THE MAYO CLINIC.

The arthritis pains and aches and stiffness came back when the doctors stopped giving the drug as they sometimes had to because of the scanty supply and sometimes did to learn whether the drug was having a lasting remedial effect. Apparently patients will have to go on taking it regularly in order to stay relieved of the arthritic symptoms and disability.

The hormone is given by injection into the muscles. Besides compound E, the Mayo physicians are trying some related hormones. One of these is a pituitary gland hormone which stimulates the adrenal gland to produce its cortical hormone. This also helped, but the supply of it depends on the supply of pituitary glands.

Compound E has been partially synthesized as a result of a long series of biochemical investigations carried out cooperatively by Dr. Kendall and his associates at the Mayo clinic and chemists of Merck and Co. The starting material must pass through more than 30 intermediate steps which can only be carried out by experienced chemists. This accounts for the excessive rarity of the material. Although production is being expanded, Merck and Co. state, regretfully, that no supplies are expected before 1950 and then only small amounts will be available.

The trial of compound E resulted from research by Dr. Hench dating back to 1929. At that time he noted that arthritic patients were unexplainably relieved of pain if they got jaundice and that women were also relieved of the arthritic pain when they became pregnant. And, as is well known, rheumatoid arthritis itself sometimes is dramatically halted with no known explanation.

This led Dr. Hench to the theory that "within every rheumatoid patient corrective forces lie dormant, awaiting proper stimulation."

The fact that some arthritis patients are temporarily better after an operation and anesthesia hinted at an adrenal gland factor. This is because during anesthesia and surgery the outer part, or cortex, of the adrenal glands is stimulated. When compound E finally became available, even though in tiny amounts, in September, 1948, its trial as an anti-arthritis drug was started.

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ENGINEERING

Liquid Oxygen Converter

➤ LIQUID oxygen will probably replace much of the highly compressed gaseous form now used in applications ranging from medical to industrial, and particularly for airplane crews flying at high altitudes. A new liquid oxygen converter, developed by W. A. Wildhack and associates of the National Bureau of Standards, will be responsible.

The converter is fully automatic, requiring no electric or other source of power. Its compactness and greatly reduced weight represent a decided advance over gaseous equipment now used to supply breathing oxygen in aircraft. Oxygen in liquid form, for pilots and personnel is already under flight testing by the U. S. Air Force in a B-17 at Wright-Patterson base in Ohio.

In addition to its use in aviation, gaseous oxygen has many other applications in modern science and technology; in the welding and cutting of metals, in manufacturing and refining processes, in the operation of certain types of engines and rockets, and in medical treatment.

For all of these uses, both weight and bulk of containers can be greatly reduced if the oxygen is stored in liquid form. Liquid oxygen is five times as dense as oxygen gas under a pressure of 2,000 pounds per square inch, the pressure used with most standard oxygen tanks.

Although the advantages of supplying oxygen in liquid form have long been recognized, its widespread use has been prevented by the disadvantage of continuous evaporation losses during storage and the necessity of controlling the build-up of pressure to that required for operation. About 50 pounds per square inch is needed for oxygen breathing regulators. The new Bureau of Standards converter solves these problems.

Briefly, it is a thermos bottle, a double-walled container with a vacuum between the walls, which scientists call a Dewar flask. The size used by the Bureau has a capacity of about 3.5 gallons. The flask is modified from the simple form by the addition of a bottom drain, together with two coils, one for build-up of pressure and one for warming the gas as it is delivered.

In reliability and safety the new converter compares favorably with high-pressure gaseous oxygen systems. Wide variation is possible in container capacity, and in delivery flow, temperature and pressure specifications. Thus, while designed specifically for aviation use, it can be used for other purposes.

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CARNIVOROUS CORSAGE—The ornament this girl is wearing comes from a Southern species of pitcher-plant, a bog-dweller with water-holding hollow leaves that trap unwary insects and use their bodies for food after they drown. Although the corsage appears to be made up of their flowers, and the objects are called "biscuit flowers," they are actually the seed-bearing structures left after the petals have dropped off. This ornamental use of pitcher-plant seed stalks was dreamed up by a florist of Wilmington, N. C., Henry Rehder.