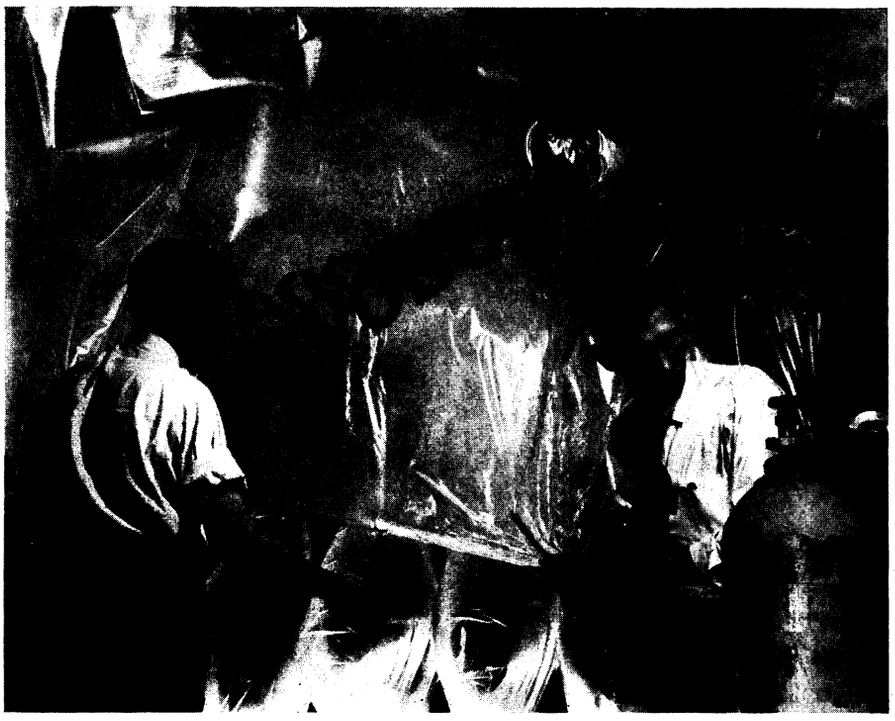

FREEDOM BALLOONS—These are the pillow-like plastic balloons used to send freedom messages to the people behind the iron curtain. "Svoboda" is Czech for freedom. Here the balloons are being inflated.

METEOROLOGY

Freedom Balloons Aimed

➤ BALLOONS carrying messages of freedom to people behind the Iron Curtain can be aimed at the desired target with a good chance that they will get there.

Knowledge of the upper air flow, the changes which might occur in it because of weather influences from over a wide area, and variations which already exist in the pattern can tell the balloon flyer where his messages will go and how long they will take to get there.

Various bursting devices, set for the proper time, can bring the messages to earth on the desired target. Some bursting devices operate on the pressure principle, bursting at a pre-determined height. By computing the trajectory of the balloon in advance, which can be done accurately, it is possible to know at just what altitude the balloon should burst so the messages will be brought to earth at the proper point.

Balloons can travel long distances, as the Japanese demonstrated during World War II, when they launched balloons designed to set fires in the American Pacific Northwest. However, the greater the distance, the less likelihood one balloon will hit the target. This can be solved by sending out a greater number of balloons.

American meteorologists and cosmic ray specialists use helium in the balloons they send into the upper atmosphere to collect information. Hydrogen is the gas being used in the balloons now being sent into the Iron Curtain countries.

Balloons are now being made of three types of material—plastic, natural rubber and neoprene, a synthetic rubber. This will probably be the first chance people behind the Iron Curtain will have to see this new American synthetic. Ultraviolet rays do damage to natural rubber, but the new neoprene balloons avoid this trouble.

Science News Letter, August 25, 1951

INVENTION

Grass Fires Put Out by Tractor-Trailed Dirt Blower

➤ FIRES IN fields of grass, grain or low brush may be extinguished with a trailer to a farm tractor which picks up fine dirt from the ground and discharges it on the burning materials. Scrapers positioned ahead of a rotary brush reduce the earth to a fine dirt which the brush can pick up. A suction fan blows the collection out through a discharge spout which is pivoted so that it can be swung from the rear to either side. Patent 2,561,701 was awarded to John E. Hurlbert, Dishman, Wash.

Science News Letter, August 25, 1951

● RADIO

Saturday, Sept. 1, 1951, 3:15-3:30 p.m. EDT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. W. Albert Noyes, Jr., chairman, Department of Chemistry, University of Rochester and chairman, Division of Chemistry and Chemical Technology, National Research Council, will discuss "World Chemical Conclave."

PHYSIOLOGY

2,000,000 Filters Function in the Kidneys

➤ MANY of you have read dramatic reports of lives being saved by artificial kidneys. You may have been surprised at the large, bulky apparatus which obviously is much larger than the kidneys in the human body. This is not so surprising when you learn that the two million little filtering units in the kidney would, if stretched out, extend about four miles. A simple explanation of the construction and functioning of the kidneys is given by the Illinois State Medical Society as follows:

The chemical waste products of the diet are eliminated by the kidneys. When these organs are not functioning properly, a condition develops which is known as nephritis. It is often called Bright's disease after the famous London physician, Dr. Richard Bright, who, in 1827, correlated swelling body tissues (dropsy) with coagulation of urine on boiling, and inflammation of kidneys.

Normally there are two kidneys, one on either side of the spinal column. They are bean-shaped, located in the upper part of the abdomen, beneath the diaphragm, behind the stomach and directly in front of the muscles of the back. The kidneys are each connected to the bladder by two long tubes, known as the ureters, and their primary function is to act as a filter in removing waste products from the blood stream.

The kidneys may be considered the most important chemical laboratory in the body, as they not only filter the waste products but conserve the body's minerals and salts and keep body fluids and chemicals in balance. They are so important that all the blood in the body, 11 to 13 pints, circulates through them every three minutes for the purpose of being freed of its waste products.

The filtering units of the kidneys are called glomeruli. They are clusters of blood vessels. As the blood circulates through the kidneys and finally through the little clusters or glomeruli, the waste products are selectively transferred from the blood into tiny funnel-like tubes, known as kidney tubules. In addition to the waste products, large quantities of water, sugar and salt pass into these tubules. This is known