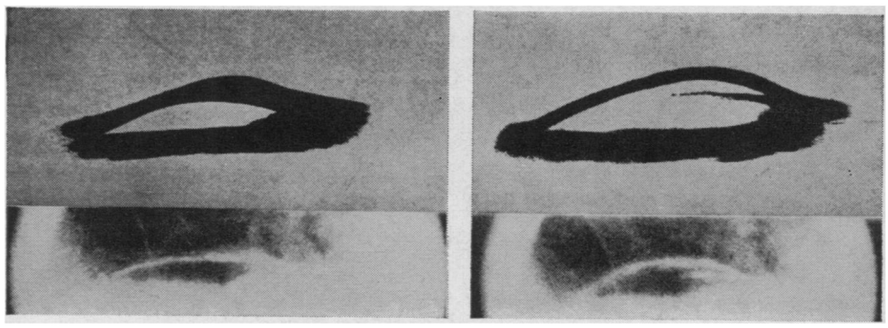
Gas Bubble Helps Spot Disease



USC

DIAGNOSTIC BUBBLE—A motion picture of a gas bubble as it travels through a human vein and ino the heart can be made with the use of film techniques developed by USC researchers. The ink sketches above the actual pictures accent what the photographs show—that the bubble is flattened at one point (left) and is back to its normal shape (right) ten seconds later as it moves through the right auricle.

➤ A NEW WAY of diagnosing one form of heart disease involves a tiny gas bubble in the bloodstream.

A carbon dioxide bubble injected into the vein in the left forearm has allowed radiologists to film its travel to the heart, thus discovering pericardial disease that affects the thin tissue enclosing the organ.

Whereas an air bubble could be expected to be fatal, carbon dioxide is 20 times more soluble than air in blood plasma and dissolves quickly.

For the examination, the patient lies on his left side in front of an upright fluoroscopic table.

Just before the radiologists inject 50 cubic centimeters of carbon dioxide, they start the motion picture film which will record the flow of gas through the superior vena cava into the right atrium.

How the gas bubble is handled by the heart's various tissues, membranes and muscles as it is nudged along by the circulating blood tells the scientists facts about how, or if, disease has affected those particular parts of the body.

The technique has been used at the University of Southern California, Los Angeles, on 90 patients, of whom 68 were found to have evidence of pericardial disease.

Dr. A. Franklin Turner of Pasadena, USC assistant professor of radiology, developed the procedure with the assistance of Drs. Harvey I. Meyers and George Jacobson, both of Los Angeles.

• *Science News, 89:306 April 30, 1966*

GENETICS

RNA Structure Revealed

➤ SCIENTISTS have moved one step closer to understanding and eventually controlling the genetic makeup of living creatures as a result of the work of two U.S. Department of Agriculture biochemists.

Drs. James T. Madison and George A. Everett of the USDA's agricultural research service have uncovered the chemical arrangement of one type of nucleic acid.

It is only the second time such a nucleic acid molecule has been broken open and its structure revealed. The molecule is one of the genetic workers known as transfer RNA, or ribonucleic acid. Transfer RNA is responsible for transferring tiny bits of information from the genetic code to new proteins, which then make up body cells.

Actually, there is an intermediate step in this complex genetic process. This is the area in which the two scientists made their advance, reported at the Federation of American Societies for Experimental Biology meeting in Atlantic City.

All proteins in the body are made up of 20 chemicals called amino acids. It is the job of transfer RNA to first select the right amino acids and then to arrange them so that the genetic properties unique to an individual can be carried into new protein.

By discovering how the code is structured in a transfer RNA molecule, scientists can tell how the amino acids will be arranged.

Drs. Madison and Everett determined the structure of tyrosine transfer RNA. Their finding came only one year after a team of USDA and Cornell University scientists announced the structure of alanine transfer RNA.

• *Science News, 89:306 April 30, 1966*

MEDICINE

Cancer Cells May Use Antibodies as Shield

➤ CANCER may be perverting the body's natural resistance to disease, Dr. Kurt J. Bloch of the Harvard Medical School, Boston, reported.

The body's basic weapons are antibodies—proteins the body produces to destroy viruses, bacteria and other disease-causing entities, including tumor cells. But one type, gamma-1 antibodies, seems to protect cancer cells.

When guinea pigs were injected with mouse tumor cells they produced gamma-1 and gamma-2 antibodies against the tumors. In test tube experiments isolated gamma-2 antibodies attached to and clumped tumor cells. With the help of other body defense proteins called "complement," they then ruptured the tumor cells.

Although gamma-1 antibodies also were capable of attaching to and clumping tumor cells, Dr. Bloch reported, they could not combine with complement.

• *Science News, 89:306 April 30, 1966*