

The annual added farm income due to just these examples of agricultural research is over \$2,000,000,000 each and every year. All this resulted from research investments that totaled over sev-

eral decades only a few tens of millions of dollars at the most. And don't forget the human lives saved and the more contented fly-free cows.

Science News Letter, April 12, 1947

BIOCHEMISTRY

Protein Synthesis Seen

Traced with radioactive sulfur, protein synthesis was carried out in the laboratory. Methionine was used with living tissue to synthesize proteins.

► THE FIRST direct observation of protein synthesis outside the animal body has been achieved through the tools of atomic science.

Two University of California scientists reported this pioneering step in the application of radioactive substances to the study of growth, cancer and other biological processes associated with the building up of organic compounds in living systems.

Surprisingly, the advance was made with radioactive sulfur, which has been available to researchers on the Berkeley campus for a number of years. The technique of study will have its widest application with radioactive carbon 14, which was only recently released to scientists by the Manhattan District.

The two researchers, Drs. Harold Tarver and Jacklyn Melchior, placed living animal tissue slices in a solution together with methionine labeled with radioactive sulfur. Methionine is one of about 25 amino acids, which are sometimes called the building blocks of all life.

The liver slices were slowly dying, with a breaking down of protein into amino acids. But so long as they lived they were building up some new protein, using the discarded amino acids. This process was demonstrated by the finding of labeled methionine incorporated into the protein of the tissue slices.

Proteins are formed by the linking together in chains of various amino acids. Drs. Tarver and Melchior found that the radioactive methionine was incorporated into the protein by the formation of peptide bonds, which are the typical linkage between the amino acid molecules in all proteins. In this linkage a carbon atom of one molecule is linked to the nitrogen atom of another molecule.

The scientists succeeded in their experiments after failure to demonstrate true protein synthesis using radioactive cysteine, another sulfur-bearing amino acid.

Dr. Tarver, reporting to the *Archives of Biochemistry*, expressed the opinion that the study, applied with radioactive carbon, provides an unexcelled technique for the study of the formation of the all-important peptide bond. For the first time biochemists are able to come to direct grips with the problem of protein synthesis.

The technique will also enable Dr. Tarver and other scientists to study the differences between protein formation in different tissues, for example between normal and cancer tissue.

Its use with sulfur will be limited, since only methionine and cysteine, of the amino acids, contain sulfur. However, all the amino acids have carbon atoms.

Science News Letter, April 12, 1947

RADAR

Aluminum Kite Reflector Is Used for Radar Target

► AN INGENUOUS target for radar reflection is being employed in connection with work perfecting automatic equipment to direct gun-fire against aircraft with greater accuracy than used during the war. Westinghouse scientists are responsible.

The target is a box-kite radar reflector built of light balsa wood and aluminum foil. It is held aloft some 600 feet above the earth by an anchored five-foot helium-filled balloon. Aluminum is employed because it is an unusually good reflector of the ultra-short waves used in radar. This is one of the reasons that tiny V-shaped strips of this metal were scattered in the sky by American bombers to blind the aircraft from enemy radar eyes. This so-called "radar counter-measure" was known as "window."

The great advantage of a high-suspended target in the development work is that its field is clear of all obstructions. Radar reflections from targets near the earth are subject to interference from ground-reflections or others from tall buildings, trees and hills. When the gun-aiming device is more nearly perfected, airplanes will be used for targets.

Science News Letter, April 12, 1947



CEILOMETER—Army Air Forces instrument measures the height of clouds by throwing up a ray of ultraviolet light which is scanned by a photo-electric cell unit. When a cloud breaks the beam, a "trace" registers on the recording instrument. The ceilometer accurately gauges cloud heights up to 10,000 feet.