

MEDICINE

Flies Spread Diarrhea

Scientific proof is now available that flies are involved in the spread of diarrheal diseases which often kill young children.

► SCIENTIFIC crime detection methods have now convicted a criminal suspected for years but never before brought up against convincing evidence of his crime. The criminal is the fly. The crime is the spread of diarrheal diseases that yearly attack babies, small children and even grown-ups, often killing the younger victims.

The heroes of the story, though they probably won't like being cast in that role, are Dr. James Watt and Scientist Dale R. Lindsay of the U. S. Public Health Service.

For two years these men have carried on their hunt for evidence to convict the fly of spreading diarrheal diseases. Modern insecticides, such as DDT, have been their chief weapons. Hidalgo County, Texas, was the scene of their activities. It was selected because it has always had a large amount of infectious diarrheal diseases as well as a major fly problem.

Towns in the county were divided into two comparable areas. One set of towns was sprayed every six weeks with DDT and periodic counts of the fly population were taken. When material increase of flies was noted, spot re-treatments were made,

sometimes as often as twice weekly.

The other set of towns was left untreated. Children in both sets of towns were studied by laboratory analyses of cultures. Family histories were taken and an analysis was made of deaths reported resulting from diarrheal diseases.

As the fly control measures progressed, a marked decrease was noted in cases of diarrheal diseases due to Shigella infection in the treated towns.

When treated and untreated towns were reversed, the treated ones being left to the mercy of fresh fly populations, and the previously untreated ones getting DDT sprayings, the number of cases of diarrhea in the towns soon became reversed. As fly populations increased, diarrhea increased, and the reverse.

Health authorities and private citizens who have fought flies on the theory that they spread diarrheal diseases now can be encouraged to renew their war on flies with scientific proof of the fly's criminal role.

Details of the study were reported in PUBLIC HEALTH REPORTS, official U. S. P. H. S. scientific publication.

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suitable radars for transport aircraft, the specifications of these radars being based upon the results of the flight testing program."

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ENGINEERING

Electron Beam Used for Study of Metal Surfaces

► A SCIENTIFIC instrument for the study of surface layers of metal less than a quarter-millionth of an inch thick may aid in the development of longer-wearing metals for aircraft engines and other products.

Known as an electron diffraction instrument, the device was built by the general engineering and consulting laboratory of the General Electric Company. A beam of electrons, the negatively charged bits of atoms, is shot through the thin sheet of metal. The image made by the electrons is captured on a fluorescent screen or photographic film for study. Surface conditions such as corrosion and crystal structure are revealed by the image from the beam.

Dr. J. G. Hutton predicted that the instrument will be important in metallurgical studies for electrical equipment and for research on a wide number of industrial products. The electron diffraction instruments are now in use in various laboratories.

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ELECTRONS AID IN METAL STUDY—Dr. J. G. Hutton is shown inserting a sample into the electron diffraction instrument which is used to study corrosion and crystal structure of metal in General Electric Company's laboratory.

AERONAUTICS

Flying Safer with Radar

► AIRPLANES in the future will bring you more surely to port through storm or darkness because of new radar designs now being developed.

Radar paints a picture of the terrain over which your plane must fly, making it possible to travel through darkness or in overcast, Lt. Comdr. E. W. Harrison of the Navy's Bureau of Aeronautics stated in Washington at the joint meeting of the International Scientific Radio Union, American Section, and the Institute of Radio Engineers.

With radar a pilot can check wind velocity and direction without leaving the course. Even in unfamiliar terrain he can safely avoid mountains and peaks. To some degree radar will warn a pilot of another aircraft in the immediate vicinity, or of a thunderstorm or weather front.

War-time sets have shown that for better performance a radar set must have:

1. Simple, readable indicator—this would present pictorial information so that a minimum of interpretation is required.
2. Switchable CSC²-pencil beam antenna

—with this either type of pattern can be selected by the pilot.

3. Stabilization of the antenna in roll—this lets the pilot bank the plane without losing the radar presentation.

4. Increased transmitter power and receiver sensitivity—this gives a greater range for beacons, land mapping and weather detection.

5. Quick-neutral stabilization position—this permits use of radar as an artificial horizon in the event of instrument failure.

6. Five microsecond pulse—this pulse is used specifically to detect weather.

These features are being incorporated in the AN/APS-42 radar, now being engineered for production.

"During the past two years the Navy, Air Force and commercial airlines have been flight testing two wartime radars to determine what features are needed for a transport radar and how such a radar can contribute to safety of flight," Comdr. Harrison said.

"At the same time Joint Air Force-Navy programs have been underway to produce