CHEMISTRY

Develop Anti-Radar Paint

A new secret anti-radar coating for airplanes has been developed by U. S. Air Force scientists that promises to revolutionize missile and aircraft detection and defense.

➤ AIR FORCE scientists have developed coatings that will allow bombers to sneak past radar warning systems with only a slight chance of detection. The still-secret anti-radar paints are expected to see wide use after they are perfected.

Defense Department officials believe the Russians are working on similar projects.

The new paints could greatly reduce the protection offered by our DEW line, the Distant Early Warning system in Canada, and the Texas tower radar warning stations in the Atlantic.

Military officials view the progress made by Wright Air Development Command scientists with mixed feelings. Although they regard the paints as a potential blessing to American air power, they believe that Russian scientists probably are at the same stage of development.

The greatest concern is over what these coatings will mean to our program of developing an anti-missile missile. Although there are several means available for spotting, tracking and taking a "lock" on an enemy intercontinental ballistic missile, radar still is the most advanced and probably the easiest to incorporate in a missile to destroy other missiles.

Our own Defense officials already plan to paint our ICBM's with anti-radar coatings if the Russians develop an anti-missile missile dependent on radar.

Although the new coatings need further improvement before they are put to wide use, one official told SCIENCE SERVICE "they are today very real and could be put to use now if we sacrificed some performance of the aircraft on which they are coated."

The new paints actually are heavy, thick coatings of radar absorbent materials and are similar to paint only insofar as they can be spread on a surface.

Nobody will say what is in the coatings, but it is known that some coatings used inside radar test chambers consist of rubber bonded to ceramics, and horse hair impregnated with carbon. Any "lossy" material, a radar engineer's term for material that causes wave loss through absorption, that can be mixed with a paint base and spread on a surface could be used. Other paints incorporate chemicals such as those in photographic emulsions to absorb radar waves and convert their electromagnetic energy into chemical energy, instead of bouncing the electromagnetic waves back to the radar station.

The problems in present anti-radar paints include their heavy weight; lack of resiliency that causes them to crack and flake off under strain; lack of resistance to rain and other weather effects; and the thickness with which they must be applied to be effective.

No paint yet developed will completely hide an object from radar, but the better paints are said to reduce greatly the chances of detection. Only certain parts of a plane need to be coated to cut down radar detection.

Science News Letter, April 19, 1958

MEDICINE

Study Smoke's Cancer Role

➤ CIGARETTE smoke may be a more important factor in lung cancer than previous tests have indicated and a new method of testing the possible cancer-producing effects of smoke is needed, three scientists report.

Cigarette smoke products, such as tars, usually have been tested cold and after an appreciable lapse of time from when the cigarette was mechanically "smoked" by a smoke collecting machine.

The new report, published in *Nature* (April 5), points out that those smoke products most likely to be possible cancer-producing agents exist only while hot and only for a few seconds. However, during their very short lifetimes the products are extremely active and possibly capable of providing the long-sought chemical step between harmless substances and cancer-producing agents.

The research was performed by Drs. M. J. Lyons, cancer research department, Royal Beatson Memorial Hospital, Glasgow, and J. F. Gibson and D. J. E. Ingram, University of Southampton.

They state that their work is based on current theories that chemical radicals existing in the very active, short-lived uncombined state may be intermediaries of cancer formation.

When atoms habitually organize themselves into identifiable groups that act as single units, they are called radicals. For example, the arrangement of one carbon and three hydrogen atoms is known as the methyl radical and can combine with many other atoms or groups of atoms to form a wide range of methyl compounds.

Normally, a radical does not exist in a free state, but is combined in a compound. However, heat, light, electricity or other chemicals can cause compounds to split momentarily, freeing the radical as a short-lived and highly active chemical unit which either recombines with the atoms from which it was split, or combines with other available atoms to form new compounds.

The British scientists measured significant amounts of free radicals present in hot smoke as it came from cigarettes. In the cooled and condensed tars they found very few free radicals.

The scientists conclude that the possible cancer-causing free radicals had recombined to a relatively inactive state by the time smoke products were used in the usual cancer studies and cannot give a true test of cigarette smoke's potential cancer-producing ability.

Science News Letter, April 19, 1958

ENGINEERING

Oil Drilling Platforms Take to the Sea

See Front Cover

➤ JULIE ANN, an offshore oil drilling platform with the longest legs—175 feet—of any platform built by its manufacturer R. G. LeTourneau, Inc., is being used in the Gulf of Mexico.

The photograph on the cover of this week's SCIENCE NEWS LETTER shows the drilling platform being towed to its destination.

Other drilling platforms already in operation emphasize the "portability" of the machines. One took a 10,000-mile voyage to the Persian Gulf. Another may be moved 1,000 miles to a new drilling location, a move said to be more economical than switching land drilling operations 15 miles.

Science News Letter, April 19, 1958

ANTHROPOMORPHS — Rubber skinned dummies that conform to the shape, size and weight of human pilots are used by North American Aviation engineers in perfecting systems for saving pilots' lives. Electronic equipment in chest and stomach cavities records important information.