

why the problem has grown steadily worse throughout the nation is the increased cluttering of vehicles on the road. More than 70,000,000 vehicles now ride on the United States streets and highways, compared to 50,000,000 just ten years ago. The figure will be pushed even higher in the future as more vehicles dirty the air in greater quantities.

Although California has the worst case of polluted air, the problem is cropping up more frequently than ever before in both cities and rural areas scattered across the United States. Flowering plants in parks of eastern cities are showing tell-tale signs of withering, and tobacco leaves on fertile farms in the Connecticut Valley are sometimes rotting from polluted air. Even the beautiful nation's capital does not escape the curtain of pollution, for a brownish haze is sometimes seen above the Washington skyline as hordes of commuters pour in and out of the city.

An accelerated program on both state and Federal levels is urged by public authorities and experts to fight air pollution before it gets completely out of hand.

Although some states have followed in California's footsteps by adopting legislation restricting air pollution, the national effort "is far from adequate for dealing effectively with the needs for air pollution control," V. G. MacKenzie, head of the

air pollution division of the U. S. Public Health Service, charged.

"Virtually 90% of the U. S. urban population lives in localities having air pollution problems and the problem will get worse in the near future due to the mushrooming population," the scientist stated. The industrial output is also expected to double within the next ten years, which will produce a flood of new products and processes contributing indirectly to air pollution.

The PHS fight against air pollution is piling up impressive evidence linking air pollution with various diseases, but the evidence is still circumstantial, Mr. MacKenzie cautioned. The Public Health Service recently announced a unique plan to expose thousands of mice, guinea pigs and rabbits to the smog-enshrouded air that humans breathe along the Los Angeles freeways. The study should reveal quickly the effects of dirty air on health that would take decades to occur in human beings.

Although the Public Health Service and some states are fighting to control pollution with their limited funds, more money for research programs and more action on all levels of government are needed. The United States appears closer to putting a man on the moon than creating a healthy environment in which to live and breathe on earth.

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the developmental stage. The unique underground system could prevent a repetition of the temporary weakening in the United States communications system that recently occurred in Nevada when communication installations were blown up.

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SPACE

U.S. Will Launch Canadian Satellite

► CANADA'S S-27 topside sounder satellite scheduled to be launched from Vandenberg Air Force Base, Calif., early in 1962 will be the first foreign satellite put up by the United States. The 280-pound satellite is designed to sound the ionosphere from an orbit 625 miles up. A prototype now is undergoing vibration and other tests.

The Canadian agency responsible for the project is the Defence Research Board in Ottawa working in close cooperation with the National Aeronautics and Space Administration. The launching vehicle will be a Thor-Agena B. rocket.

One feature of the satellite will be two antennas each 75 feet long and two others each 37½ feet long. They will be extended after the satellite is in orbit. Two 75-foot antennas will be tested in a four-stage Javelin rocket to be launched by NASA in June from Wallops Island. Purpose is to make sure that the antennas after uncoiling through specially-designed guides extend completely.

Dr. John Chapman of the Defence Research Telecommunications Establishment at Ottawa said the Canadian satellite will provide information leading to better worldwide communications and improved measurement of radar wave distortion in the ballistic missile early warning system.

Dr. Chapman said two satellites like the S-27 could carry out all the sounding of the ionosphere now being done by 140 ground stations around the world. He predicted this might be accomplished in five to ten years.

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ASTRONOMY

Artificial Moon Used To Study the Real One

► RUSSIAN scientists are using an artificial moon to learn more about the true moon's surface.

The strength of radio signals sent by the moon is compared with artificial signals of the land-based moon by alternately pointing a radio telescope at the moon and the disk, Prof. V. Troitskiy at the Yalta Observatory reports in a translation by the U.S. Joint Publications Research Service in Washington, D. C. The true intensity of the moon's signals can then be determined.

Radio signals tell scientists much about the moon's surface and its temperature. By finding out the true strength of the signals, scientists can be more exact about certain moon features such as thickness of the moon dust believed coating the surface.

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MEDICINE

Hormone Cancer Aid

► THE LONG-TERM search for male hormones useful in treating female cancer is seen helped by a discovery that oxygen is not necessary to the hormones' activity.

Natural male hormones have oxygen atoms attached to the carbon ring structures. Heretofore, scientists have believed oxygen to be necessary for male hormone effects.

The finding completely upsets prevailing theories, the American Cancer Society, which has been supporting the research, said. Drs. Albert Segaloff and R. Bruce Gabbard of the Alton Ochsner Medical Foundation in New Orleans succeeded in

stripping the steroid skeleton of oxygen atoms and found to their surprise that the bare "bones" of the molecule still showed male hormone (androgen) effects.

Testosterone is a natural androgen, which has two oxygen atoms in the molecule. Relatively minor alterations—the addition or shifting of one or a few carbon, oxygen and hydrogen atoms—transforms the steroid skeleton into an amazing array of potent hormones with masculinizing, feminizing, stress-withstanding and other effects.

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TECHNOLOGY

Underground Network

► A REVOLUTIONARY underground communications network that sends messages deep within the earth even if the United States is under a nuclear bombardment is being developed.

Low frequency radio signals shot through a dense rock mass underlying the entire United States would be picked up by long underground antennas scattered in drill holes throughout the country. The deep natural radio "cable" is jam-proof and its messages cannot be detected at the surface.

The system is still in the experimental stage. Antennas could be placed as much as 100 miles apart although 50 miles is now

thought more realistic. Antennas up to a mile in length would be lowered into a drill hole lined with a protective coating.

The dense granite rock mass generally ranging from 500 to several thousand feet below the earth's surface acts as a channel for low-frequency waves sent by a transmitter. The overlying layered rocks prevent any "burrowing" messages from being intercepted or jammed.

The system was originally pioneered by Gregory J. Harmon, an engineer at the Raytheon Company, Waltham, Mass. Other organizations are also currently conducting research in trying to push the project past