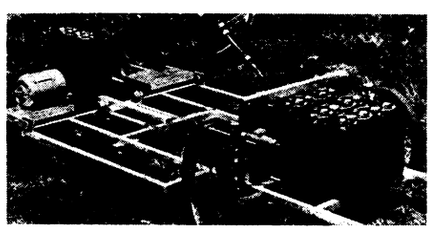
# Electric Cars: They're Cleaner, But . . .

The electric automobile that delighted Grandma back in the early 1900's may turn out to be a partial answer to air pollution, but don't hold your breath.

**For, while an electric car** for short distances could become practical soon it will not only not replace gasoline-powered cars, but it may actually increase air pollution from other sources.



Electric car—a drive to cleaner air.

A Federal Power Commission report sent to the Senate commerce committee Feb. 24 exemplifies the confused state of affairs.

"Satisfactory technology for short distance electrically powered vehicles is available today," it notes on page one.

Then, 14 pages later, it adds, "An automobile, even a small car, cannot have a range of 150 miles with any presently available storage-battery systems. . . ." It may be five to ten years before more advanced systems now being studied are ready for road testing, the report observes.

Even the advent of electric cars in large numbers won't mean the end of the internal combustion engine, the FPC points out. Americans, who generally make one car do for both around-the-corner trips and cross-country vacations, would probably only buy an electric as a second car.

At most, the FPC says, electric cars are likely to capture about a third of the auto market. That level might be reached, if all goes well, by 1985, it speculates.

**Some of the reduction** in air pollution achieved by using exhaustless electrics may be offset, however, by increased exhausts from the nation's electric generating plants. The FPC notes that this could result in shifting the pollution burden from near-ground layers in the city to high-altitude layers in the country.

And, it observes without comment, "The various chemical reactions which take place in some of the secondary batteries and fuel cells newly proposed for vehicle propulsion may also yield deleterious products."

An even more thorough study of the problems of transportation and pollution is presently being conducted by a Panel on Electrically Powered Vehicles appointed in January by the Commerce Department's Technical Advisory Board. A report is expected within a year.

**A measure of the problem** was contained in the fifth report of the Secretary of Health, Education and Welfare on automotive air pollution presented to Congress in December.

While present auto exhaust emission control arrangements seem effective when installed, HEW says, ". . . it appears that emissions definitely do increase with increasing car mileage. . . ."

And data from Los Angeles, the American city with the most stringent air pollution control program, indicates that levels of oxidants, carbon monoxide and nitrogen oxides have all increased in the last six years.

"The ultimate solution," notes the FPC, ". . . lies in conversion of all vehicles to some non-polluting power source or in effective exhaust controls."

# More on Drug Abuse

Final arguments over whether or not Librium and Valium, two well known tranquilizers, should be subject to the restrictions of the 1965 Drug Abuse Control Amendments were heard last week by Government hearing examiner Edward Buttle. FDA Commissioner James L. Goddard will decide, within the next two weeks if the drugs have a "potential for abuse" under the law, and if they should be restricted as are dangerous drugs.

For months the Government and the manufacturer, Hoffmann-La Roche, have been debating the "potential for abuse" of these two drugs that are used to relieve tension, fear and anxiety, and to control acute withdrawal symptoms in alcoholics. Both Librium and Valium are chemically and pharmacologically unrelated to other types of tranquilizers such as barbiturates and amphetamines; those are already under the Amendments' jurisdiction.

FDA lawyer T. Gorman Reilly, argued for a "reasonable probability" of abuse in the future if restrictive action is not taken. Reilly referred frequently to experimental tests conducted on animals and on seriously ill mental patients to demonstrate the possibility of dangerous effects from the drugs.

"You cannot give a drug to a monkey and expect to find out whether or not I'm going to abuse it," countered Thomas Finney, counsel for Hoffmann-La Roche. Nor, he said, is it appropriate to extrapolate data gained from mental patients given excessive doses to normal therapeutic uses in less severe cases.

The company also presented evidence in response to the Government's case linking Librium and Valium to barbiturates in their potential for abuse. Patients taking Librium or Val-

ium, said Finney, do not get a kick or high. There is no feeling of elation; therefore, there is no desire to take the drugs in excessive doses or for non-therapeutic reasons.

The Government suggests that because Librium and Valium are used to treat alcoholics, these persons would be likely to misuse the drugs if they could not get alcohol.

"That presupposes a return to prohibition," Finney retorted. The drugs relieve the symptoms that lead people to drink but do not produce the same effect, certainly not as fast or effectively, Finney contended.

## Laser Modulation

Frequency modulation of a laser beam, a discovery that could be the key to making laser light a practical method of communication, has been achieved by Dr. William J. Thaler, a physicist at Georgetown University in Washington, D.C.

Most of the research aimed at discovering an efficient way to modulate laser beams has centered on finding techniques for varying the amplitude, or intensity. This has usually been done by electro-optical devices that change the amplitude of the laser beam in accordance with the signal to be transmitted.

**Such devices** are both inefficient and suffer from the same problems with respect to background noise as does an AM radio system.

The apparatus developed by Dr. Thaler produces frequency modulation of a laser beam while the amplitude remains constant, changing it in such a way that the variation represents the audible sounds.

His device makes use of an interaction between the laser beam and a moving, periodic density disturbance—the bending that results when a ray of light passes from one transparent substance into another. Such disturbances can be generated by ultrasonic waves in transparent liquids or solids, or by propagating electromagnetic waves in electro-optical crystals.

**By modulating** the frequency of the periodic disturbances, Dr. Thaler has succeeded in modulating the frequency of the laser beam. He has transmitted FM music and a voice channel simultaneously over a single laser beam one-tenth of an inch in diameter to a distance of one-half mile.

The frequency modulated laser system has the same advantages over amplitude modulation as an FM radio has over AM. Interferences from lightning, electrical machinery or other source do not affect either FM system.

Dr. Thaler has applied for a patent.