ponents of the pollution contributed by automobiles (about 60 percent of the total air pollution).

Controls even more stringent than those now being proposed will become more necessary as more autos hit the road. A panel of industry and academic experts which reported on the subject last October (SN: 11/4/67) recommended that by 1980 hydrocarbons should be reduced to 25 parts per million, of auto exhaust, compared to 1968 restrictions of 275 ppm., and carbon monoxide should be lowered from 1.5 percent to 0.25 percent.

The tighter standards will have to be met by different, more expensive, more complicated devices. Among the possibilities still in the future are chemical cleaners, afterburners and large air injectors, all of which have yet to be proved practical and economical.

Putting the standards on a grams-per-mile basis was made possible by studies of output from cars of many sizes, which allowed scientists from HEW's National Center for Air Pollution Control to say how much pollution would be contained at different concentrations for various engine displacements. A small car with a concentration of 275 ppm. hydrocarbons puts out 2.3 grams per mile; a very large car at the same concentration emits 4.0 grams. The new standard is 2.2 grams for cars of any size.

With this graph before them, inspectors can make the simple concentration measurement and relate it to total amount emitted, depending on the size of the car.

Evaporation control hardware has yet to be developed—the Commerce Department panel lists 11 possible methods in its just-published technical back-up to the October report—but the most likely are a charcoal canister to absorb evaporation, or means to store the vapor in the crankcase until the engine cools off. Most evaporation takes place after the engine is stopped and fuel, still hot, is not being burned.

The proposed standard will limit evaporation to six grams in a test which stimulates a typical day's driving.

Lead, another pollutant from gasoline engines, will not come under restriction by the new standards. The panel report recommends that standards for the lead content of gasoline, added as an anti-knock component, be set by the government, even though the exact effect of small concentrations of the poisonous element in the atmosphere isn't known. Another stimulus to lead control is that the metal clogs chemical exhaust cleaners that otherwise might be much more effective.

HEW so far, is limiting its attack on lead to a study of its effects on humans.

MUMPS

Armed Forces Eye Vaccine

Mumps, like measles, is usually regarded as a minor illness of childhood. But in a small percentage of children and a larger proportion of adults, complications may impair the brain, the eyes, the heart and the reproductive organs.

Men of age to volunteer or be drafted into service who have not had the disease as children are among those liable to possible infection of the reproductive organs. Inflammation of the testes, orchitis, can lead to sterility.

Since the licensing of the first live virus vaccine against mumps in this country, last month, the three armed services have been considering its use, but have not yet decided exactly how to approach it.

One consideration in the services is the declining rate of epidemics, leading medical officers to believe the disease is tending to affect patients earlier in life. For example, during World War I, a 1918 study found a ratio of more than 75 cases of mumps per 1,000 men inducted. By World War II, the rate had fallen to five men per thousand, and in 1967 it had fallen to less than one per thousand per year. Another problem is whether young men can remember having had mumps.

The mumps virus was first discovered in 1934, and killed virus vaccines have been in use for a number of years, but the protection they provide is temporary. Killed virus vaccines are not generally recommended for children because they provide protection during a time of life when the effects of the disease are usually mild. Because mumps is more dangerous for adults, short-term immunity during childhood accomplishes little.

The new live weakened mumps virus vaccine was developed by Drs. Eugene Buynak and Maurice R. Hilleman of the Merck Sharp & Dohme Research Laboratories. The particular strain used is the Jeryl Lynn (B level) strain, named after the daughter of Dr. Hilleman from whom the virus was initially recovered (SN: 7/9/66, page 21).

The new strain was used in field trials in which the vaccine was given to more than 16,000 persons. Of these, 6,500 children and adults were susceptible because they had never had mumps, and 95 percnt of these developed protective antibodies against the disease.

The Division of Biologics Standards of the National Institutions of Health made an 18-month study of the vaccine's safety and potency, the basis for its licensing by the Public Health Service.

Even with the new vaccine, however, it is not known yet how much long-term immunity will be conferred. With the measles vaccine, researchers had four years to check its efficacy, and with the polio vaccine they had five years, Merck officials point out.

Immunity levels appear to be undiminished for two years because antibodies have been retained in a limited number of tested persons, but Dr. William H. Stewart, Surgeon General of the Public Health Service, says additional observation will be necessary to determine the level of protection. (A Soviet live-virus mumps vaccine available since 1962 has given immunity for only a few years.) Therefore, it is not recommended for routine use in infants and young children. Children under one year of age may have antibodies from their mothers that would interfere with the effect of the inoculation.

The PHS advisory committee on immunization practices lists a number of cautions to be observed by physicians who use the vaccine. The usual one concerned with allergies to ingredients of the virus culture—in this case chicken eggs—should be an indication against its use. Also in this case no one should be given the vaccine who is allergic to neomycin, an antibiotic that is used in the culture. No one ill with a fever-producing disease should have it, and because the effect is uncertain, pregnant women should probably be exempt.

Other contraindications include leukemia and other malignancies and "altered resistance from therapy" with steroids and radiation as well as other drugs that could predispose the patient to complications.

This vaccine should not be given in conjunction with other vaccines, such as those against measles, polio, whooping cough and diphtheria, until evaluation has been achieved through controlled investigations. Whenever possible, this inoculation should be separated by about a month from other shots.

The advisory committee recommends "continued surveillance" now that an effective vaccine is available. It emphasizes the need for improved reporting of mumps cases and any complications, patterns of vaccine use, effectiveness of vaccine after exposure to natural infection, as well as general vaccine performance.

Merck Sharp & Dohme has sent out a million doses of the vaccine, which will be available to physicians through retail druggists.