

and scientists—had been lulled by new auto emission standards and the devices they spawned, and by paper calculations of supposed reductions in air pollution.

"We've collectively loused up a lot of things we should have known about," he says, largely by failing to view pollution in its totality. For example, auto emission devices may reduce carbon monoxide and hydrocarbon emissions; at the same time they have apparently increased the reactivity of the hydrocarbons that still escape into the air by some 20 percent.

Skepticism about auto emission devices was widespread at the symposium (although Dr. Libby expressed belief they would be workable eventually). "Should I ask the legislature to spend \$25 million on compulsory inspection of motor vehicles for emission control?" asked Schuneman. "Will it do any real good?" He doubts that the average car repair shop or service station could do the repair job even if the deficiencies were revealed by inspection, or that retrofitted emission control devices on used cars would work well unless the car was also overhauled.

**Speakers made it clear** that the photochemical smog problem is no longer peculiar to Los Angeles—although the only enclave of expertise on the problem is located there. There is good evidence, says Schuneman, that the problem is severe throughout the megalopolitan area from Boston to Norfolk, Va., and in many other cities. But the only systematic monitoring work is being done in Los Angeles. And the 20 monitoring stations in the Los Angeles basin are by no means enough, says Dr. Pitts.

Most of the participants spoke of gaps in research, not only into the complex phenomenon of photochemical smog but also into the subtleties of the kinds of pollution that have existed since the beginning of the industrial revolution.

Knowledge of pollutants' health effects is similarly sketchy. Dr. Vaun A. Newill, a physician with the Air Pollution Control Office, replied, "We don't know," a half dozen times in response to questions from the audience regarding chronic long-term effects of a number of pollutants, including lead, cadmium, mercury and even the ubiquitous and long-studied sulfur dioxide. Epidemiological studies show a clear correlation between  $\text{SO}_2$  levels and respiratory diseases, he said, especially in children.

Nitrogen oxides, a component of photochemical smog, apparently are harmful to health in their own right. Criteria to be issued soon by APCO point out several problems:  $\text{NO}_2$ , for instance, causes loss of cilia, disruption of bronchiole cells and greater mortality

from bacterial and viral infections. "But," said Dr. Newill, "we have a paucity of epidemiological information on  $\text{NO}_2$ ."

Dr. H. A. Panofsky, a Pennsylvania State University meteorologist, pointed to weaknesses in the knowledge of mesoscale meteorology, the meteorology of areas 10 to 20 miles in diameter, or about the size of many urban areas. Such knowledge, in the form of sophisticated mathematical models, is badly needed, he says, so that meteorologists can help air pollution control officials.

**A new philosophy** of air pollution control is in the process of being born, most of the participants agree. Dr. Newill, for example, stated categorically that lead should be removed from gasoline—even though ambient amounts are still below acute toxic levels and effects of sub-acute levels are still unknown. "The attitude that is developing, for example, in the President's Council on Environmental Quality," said Dr. Newill, "is that we cannot wait for proven deleterious health effects before we take action." □

#### SCIENCE TALENT

### Forty winners

Forty of the nation's most scientifically talented high school seniors were named winners in the 30th annual Science Talent Search this week. They were chosen from 1,110 entrants in the nation's top science competition.

The winners, 12 girls and 28 boys, have been invited to Washington to attend the Science Talent Institute, a five-day expenses-paid session, Feb. 24 through March 1. During the institute they will be judged for \$67,500 in Westinghouse Science Scholarships and Awards in the final phase of the Science Talent Search conducted by Science Clubs of America, a Science Service activity. The winners come from 33 schools in 15 states. Twenty-one of the 33 schools in this year's search had not placed winners in previous years.

Of the 17,751 sets of entry materials requested for the Science Talent Search, 1,110 fully qualified entries were judged. Requirements included writing a report on an individual science research project, submission of school records and faculty recommendations.

**By state**, the winners are:

Alaska: Delores E. Walther, East Anchorage H. S., Anchorage.

California: Glenn H. Stevens, Foothill H. S., Bakersfield; Henry C. Hamaker, Cubberley Sr. H. S., Palo Alto.

Colorado: James G. Ogg, Fort Collins H. S., Fort Collins.

Florida: Ira H. Chinoy and Christine E. Sturtz, Nova H. S., Fort

Lauderdale; Glenn M. Greenwald, North Miami Sr. H. S., North Miami.

Illinois: Anne W. Gunter, Forest View H. S., Arlington Heights; Jonathan Baldo, Maine Twp. H. S. West, Des Plaines; Warren G. Lavey, Evanston Twp. H. S., Evanston; James H. Van Aken, Lyons Twp. H. S., LaGrange; Mary Jo Wilson, Oswego H. S., Oswego; Neil S. Greenspan, Niles Twp. H. S. North, Skokie.

New Jersey: Mitchell L. Dong, Bergenfield H. S., Bergenfield.

New Mexico: Edward J. Hoskins, Las Cruces H. S., Las Cruces.

New York: David R. Kenigsberg, Benjamin N. Cardozo H. S., Bayside; Wensor Ling and Mitchell S. Raps, Francis Lewis H. S., Flushing; Gary A. Feldman and Orrin E. Tilevitz, Forest Hills H. S., Forest Hills; Sue Klapholz, Jamaica H. S., Jamaica; Robert A. Brady, Samson D. Gruber, Marie S. Jernazian, Cecilia Wen-Ya Lo and Martin Wen-Yu Lo, Bronx H. S. of Science, New York.

North Carolina: Lenwood S. Heath Jr., North Pitt H. S., Bethel.

Ohio: Tucker O. Collins, Bay H. S., Bay Village; Paula L. Bockenstedt, Wayne H. S., Dayton.

Pennsylvania: M. Bruce Fegley, Boyertown Area H. S., Boyertown; Kraig L. Derstler, Columbia H. S., Columbia; Richard B. Gold, Baldwin H. S., Pittsburgh; Donald Brenner, Cheltenham Twp. H. S., Wyncote.

South Carolina: Thomas H. Fly, Spartanburg H. S., Spartanburg.

Texas: Howard W. Ludwig, A. N. McCallum H. S., Austin.

Virginia: James C. Snipes, Wakefield H. S., Arlington; Kimberlee J. Benart, Buckingham Central H. S., Buckingham; Debra A. Meloy, W. T. Woodson H. S., Fairfax.

Wisconsin: Nanette M. Nelson, Southwest H. S., Green Bay; Laura J. Brown, West H. S., Madison. □

#### SOVIET SUCCESS

### Venus landing

Several times in the past Soviet space engineers have tried to land a space-probe payload on the surface of Venus. Despite one announcement of success, later retracted, all past attempts were failures. Now they say they have succeeded.

According to a report this week from the Soviet news agency Tass, the latest such probe, Venera 7 (SN: 12/19/70, p. 461), did reach the surface of the planet on Dec. 15 and transmitted from there for 23 minutes. Data indicated that the temperatures and pressures at the surface were 475 degrees C., plus or minus 20 degrees, and 90 atmospheres, plus or minus 15 atmospheres, said the report. □