UPI

Smoke-billowing jet
Halt pollution or stop flights

by installing control devices or stop the flights.

In Philadelphia, the city government is taking the nation's biggest industry to court, charging antitrust violations resulting in air pollution damages. City solicitor Edward G. Bauer filed a complaint in the U.S. District Court for Eastern Pennsylvania that charged AMA and 13 motor vehicle makers with conspiring to restrain development and installation of motor vehicle air pollution control equipment, in violation of the Sherman Antitrust Act.

The city seeks a judgment of triple damages and costs "for the injuries sustained by plaintiff and other members of the class represented by it." The amount of the damages was not stated. Mr. Bauer said Philadelphia's complaint represents "all municipalities, county and local governments, states and public bodies in the U.S., their citizens and members of the public whom they serve, who have been injured in their business and property as a result of the illegal acts."

A similar civil action was brought by the U.S. Government against most of the same defendants in the U.S. District Court for Central California on Jan. 10, 1969. That suit was later settled when the court approved a consent decree offered by AMA and the four major auto makers. The auto makers promised not to conspire to obstruct the development of antipollution devices for cars, but they did not admit any guilt.

This settlement has left many people unhappy, including consumer advocate Ralph Nader and California pollution control officials. Mr. Nader would like to see the Justice Department's investigation made public. And Los Angeles County officials are now planning to file a petition to reopen the federal suit. Los Angeles County Supervisor Kenneth Hahn says that the presidents of auto companies should be "criminally indicted because they have endangered the health of the public in order to make a profit."

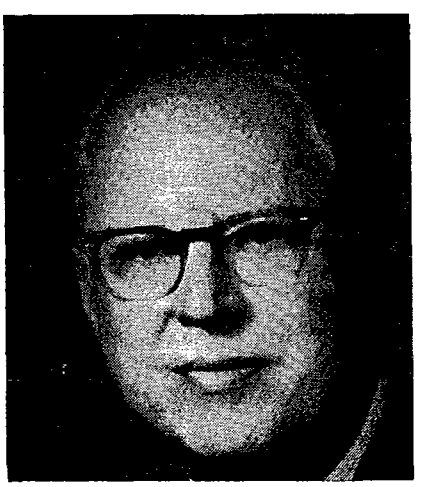
AUTO EMISSIONS:
No Lead in Gas?

The removal of lead from gasoline would have wide-ranging impact on the chemical and metals industries. Such a move would eliminate an annual gasoline additives market valued at $400 million for organolead compounds, $85 to $90 million for scavengers, and could result in the layoff of 8000 to 10,000 production workers in the chemical and metals industries.

The exact date of lead's demise is not clear but there is now little doubt that the four producers of tetramethyl- and tetraethyllead can look forward to a rapidly declining market for their products. In his pollution message to Congress, President Nixon says auto makers are preparing automobiles for 1972 that will not use lead. He asks the petroleum industry to see that suitable nonleaded gasoline is made widely available for these cars when they come on the market.

Five oil companies have already agreed to produce nonleaded gasoline but say that Detroit must first revamp its engines to utilize the fuels. Standard Oil (Ind.) has been offering a high-performance lead-free premium gasoline in eastern and southern states for several years. Atlantic Richfield, Getty Oil, Standard Oil (Calif.), and Union Oil say they would also market a lead-free gasoline.

Du Pont and Ethyl Corp. are by far the largest producers of tetraethyl- and tetramethyllead. Other producers are Houston Chemical (owned by PPG Industries) and Nalco Chemical. Producers in general say that the replacement of lead compounds will cause gasoline prices to rise, that lead is not now a health hazard, and that a nonleaded gasoline might cause more smog rather than less because of increased emissions of aromatics and aldehydes.



Ethyl's Gottwald
A lot to lose

While the public and government are very much a part of the lead controversy, the heart of the problem is quite technical. Although research has been done on manganese, tin, copper, and other compounds as gasoline additives, no satisfactory replacement has been found for TEL and TML. Only organoleads provide antiknock properties and high octane ratings. In designing an internal combustion engine to burn lead-free gas, Detroit could lower engine compression ratios, which would result in increased fuel consumption. Auto makers could also design an engine for high-octane gasolines, but these fuels would have to contain more aromatics than is now the case. Mr. Nixon says he is starting a program to find an unconventionally powered, virtually pollution-free auto within five years.

Regardless of what comes off the drawing boards in the way of automobile redesign, real dislocations will be created within the petroleum, chemical, and metals industries. For example, about 265,000 tons of lead or 20% of the nation's total consumption now goes to TML/TEL. In addition, the organoleads accounted for about 85% of sodium metal consumption. One chemical company estimates the value of TML/TEL sales at $400 million a year and says that perhaps 6000 production workers are employed in making the two compounds in this country.

The bromine industry is also closely connected to gasoline additives. Three fourths of bromine production now goes to produce ethylene dibromide. Perhaps 90% of ethylene dibromide output goes to gasoline where it acts as a scavenger to prevent lead deposition in engines. C&EN estimates that the gasoline additives market for ethylene dibromide is $75 million annually.

Ethylene dichloride also finds use as a scavenger. Total sales to gasoline makers were about $12 million last year.

WASTE CONTROL:
Dow Sells Know-how

Dow Chemical is proving how to turn the sometimes unprofitable pollution control business into a profit making one. Dow's solution, for a better economic balance sheet, is to market the technology it has developed to solve its own pollution problems. As Dow president Herbert D. Doan tells C&EN, "This is one of the most clean-cut examples of Dow's internal pollution control technology being made available to others. This commercialization process has been going on for several

years based on our conviction that the chemical industry has much to contribute to environmental improvements."

Later this month, Dow will form Dow Engineering Co. The new subsidiary, to be headed by C. C. Armstrong, will initially design and manage incinerator systems for liquid and solid wastes. Later on, it may get involved in other things.

The events which led to the formation of this new subsidiary started more than a year ago when 3M Co., which is well known for its own technological expertise, came to Dow for help with liquid and solid industrial waste disposal problems for its plants in the St. Paul, Minn., area. Dow, which operates two incinerators at its huge Midland, Mich., complex, agreed to help design and manage an incinerator system for 3M that would not create an air pollution problem. Minnesota regulations state that emissions must be 0.1 grain or less per cubic foot of dry exhaust. 3M will probably start building the $4.2 million incinerator in May for completion by the summer of 1971.

The 3M incinerator is the rotary kiln type and includes a secondary combustion chamber to consume smoke and odors, a quench chamber, a scrubber, demister, and waste water treatment system. Besides the fully automated incinerator, Dow also designed systems for handling toxic and hazardous chemicals.

The system has the most advanced pollution control technology, 3M's manager of environmental and civil engineering Joseph T. Ling says. The incinerator will burn primarily liquid wastes, such as industrial solvents. The facility will include a materials handling building and 10 large tanks for liquid waste storage.

Dow is currently talking with six other companies about designing incinerator systems, Charles L. Sercu, assistant manager of Dow's relatively new environmental control systems business group tells C&EN. "With our in-house expertise, we can solve a variety of problems in a hurry. Our own incinerators readily serve as testing units to determine parameters for designing incinerators to solve a specific problem or to combust a variety of liquid and solid materials." Dow Engineering Co. will design, manage, and provide startup service for incinerator systems. Although Dow doesn't sell equipment, it will construct the units at the client's option.

Dow built its first incinerator at Midland in 1947. It is a 30- by 12-foot rotary kiln type. Last fall, another incinerator for burning tar wastes was put into operation at the same site.

UNIVERSITIES:
NASA Lowers Funds

More than 200 representatives from some 125 U.S. colleges and universities gathered last week at the National Aeronautics and Space Administration headquarters in Washington, D.C., to hear the latest word about their role in future space programs. Although the meeting was intended by NASA officials to assure the academic community that it still has an important role to play in the space effort, what came out of the all-day program was less than reassuring. As one university representative put it, "This is what we call the wake after the funeral."

Not only is NASA's fiscal 1971 budget the lowest since 1962, but NASA's R&D obligations to colleges and universities will drop almost 19% from fiscal 1970. NASA's overall R&D obligations are also down. And these drops are in the face of an overall increase in federally supported academic R&D spending (see page 32).

NASA's Sustaining University Program, which has been losing funds over the past few years, has been terminated in 1971, resulting in the loss of 204 predoctoral traineeships and the closing of the administration and management programs which SUP funded. However, Dr. Francis (Frank) B. Smith, NASA's assistant administrator for university affairs, told the audience that earth observations research and cooperative NASA center-university research—part of SUP—will probably be continued if NASA can find funds elsewhere within the agency.

"This year," explained Dr. Smith, "we estimate that $3 to $5 million of the same kinds of grants—but not the same grants—previously supported by SUP will be continued through agency funds."

Academic scientists who were previously supported by the Office of Space Science and Applications will suffer the severest blow of NASA-funded scientists in fiscal 1971. Although OSSA's budget will increase somewhat (one of the only NASA intraagency budgets which will), R&D obligations to universities will drop almost 17% to $40 million. Biosciences are affected the most, with a 30% cut in funds. Twenty-eight bioscience grants were reduced and 35 were terminated. OSSA support of space applications and physics and astronomy research will increase, although R&D support to the universities in the latter field will decrease because of a phasing out of data analysis support and support for flight experiments; a reduction in the Explorer program; and deferral of the high-energy astronomical observatory.

Dr. Hermann Kurzweg, research division director of the Office of Advanced Research and Technology, said that OART R&D funds to academics will decrease by 11%, although the interdisciplinary laboratory centers which have been established will continue to be funded, but at a lower level. Basic research money in OART will stay about the same as fiscal 1970.

NASA's Francis Smith
Find funds elsewhere

Universities will continue to have an important role in manned space flight programs in the seventies and eighties, maintained Dr. Charles Donlan, deputy associate administrator of the Office of Manned Space Flight, despite an almost 10% drop in R&D support by OMSF in 1971. He reminded the audience that the "continued education of the kinds of people needed to work in these fields is another role of the universities."

NASA's cuts in R&D to universities add to the continuing problem of declining R&D spending rates by institutes of higher learning. According to a just-released National Science Foundation "Science Resources Survey," R&D spending by the academic community grew at an annual rate of only 11.6% from 1966 to 1968, down from 17% between 1958 and 1966.

METALS PROCESSING:
Enter Squeeze Casting

Squeeze casting—a revolutionary new process in the U.S. but an old revolutionary process in the Soviet Union—may radically change the art of shaping copper, aluminum, iron, and steel within the next five years. In doing so, squeeze casting may reduce by 25 to 50% the production cost—and perhaps the selling price—of equipment components such as gears, housings, and extrusion dies. while at the same