

REGULATORY ALERT

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1459

FEDERAL REGULATION

RA No. 009-74
August 26, 1974

VINYL CHLORIDE MONOMER IN AEROSOLS CONSUMER PRODUCT SAFETY COMMISSION

The CPSC proposal (39 Fed. Reg. 18115, 5/23/74) to ban and to require repurchase of all aerosols containing vinyl chloride monomer which are subject to the Federal Hazardous Substances Act was finalized by publication in the Federal Register of Wednesday, August 21, 1974, pages 30112-30114. Persons adversely affected by the order may file written objections on or before September 20, 1974 and may request a hearing. A hearing will be granted if objections are supported by grounds legally sufficient to justify the relief. Except for those provisions stayed by filing proper objections, the regulation will become effective October 7, 1974.

The preamble of the order summarizes the information relied upon by the Commission for imposing the ban and discusses the submissions filed during the original comment period.

In setting forth its reasons for promulgation of the order, the Commission among other things concluded:

1. That the Congressional intent of Section 15 of the Federal Hazardous Substances Act requiring repurchase of banned hazardous substances was not only to provide retailers and distributors a means to recover economic losses which may result when a product is declared to be a banned hazardous substance, but also contemplated that the provisions of §15 would facilitate the removal of such products from households.
2. That the degree and nature of the hazard presented by the use of self-pressurized household products containing vinyl chloride monomer is such that the public health can only be served by keeping those products out of the channels of interstate commerce. The action to classify such products as banned hazardous substances applies to such products irrespective

of the date on which the products were introduced into interstate commerce.

3. On October 7 all self-pressurized household products containing vinyl chloride monomer will be subject to all provisions of the FHSA applicable to banned hazardous substances including repurchase under §15.

Please advise us by September 10th of your views as to any CSMA action.

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Department of Legislative
and Regulatory Affairs

REGULATORY ALERT

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FEDERAL REGULATION

RA No. 010-74
August 26, 1974

CONSUMER PRODUCT SAFETY COMMISSION PROCEDURE FOR DISCLOSURE OF INFORMATION UNDER THE FREEDOM OF INFORMATION ACT

The Federal Register of August 21, 1974 (39 Fed. Reg. 30297) contains proposed procedures of the Consumer Product Safety Commission for disclosure or production of information under the Freedom of Information Act. Pending issuance of final regulations, the Commission intends to use these proposed rules as guidelines in making its records (including those from all acts transferred to the Commission) available to the public.

The preamble of the proposal contains a broad statement to the effect that information exempted from disclosure under the Freedom of Information Act may, where not prohibited by law, nevertheless be made available when the Commission determines that disclosure is in the public interest. This statement is toned down somewhat by a following paragraph which cites §25(c) of the Consumer Product Safety Act wherein accident or investigation reports may be made available to the public so long as it does not identify any injured person or person treating the injured person without their consent.

The proposal is divided into 3 subparts applicable to the following areas:

- (1) Production or Disclosure under the Freedom of Information Act (5 U.S.C. 552(a));
- (2) Exemptions from Production and Disclosure under the Freedom of Information Act (5 U.S.C. 552(b)) and
- (3) Disclosure of Commission Accident or Investigation Reports under the Consumer Product Safety Commission Act (15 U.S.C. 2074(c)).

Interested persons may submit comments on or before October 21, 1974. Please advise us by October 1st of your views as to any CSMA submission.

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and Regulatory Affairs

REGULATORY ALERT



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RA 011-74
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FEDERAL REGULATION

RA No. 011-74
August 26, 1974

FDA - VINYL CHLORIDE AS INGREDIENT OF DRUG AND COSMETIC PRODUCTS

The Federal Register of August 26, 1974 contains a final order issued by the Food and Drug Administration declaring vinyl chloride as a deleterious substance which may render any cosmetic aerosol product which contains it as an ingredient injurious to users. Any cosmetic aerosol product containing vinyl chloride as an ingredient will be deemed to be adulterated under Section 601(a) of the Federal Food, Drug, and Cosmetic Act and will be subject to regulatory action.

With regard to the use of aerosol drug preparations containing vinyl chloride as an ingredient or propellant, the Commissioner has found that there is a lack of general recognition by qualified experts of the safety or effectiveness of such preparations. Accordingly, any such product will be considered to be a new drug requiring an approved new drug application under Section 505 of the Act.

The order becomes effective on September 25, 1974.

The preamble of the order contains a request for data on the extent of the usage of polyvinyl chloride containers, the rates of extraction chloride monomer from these containers and other matters pertaining to the safety of these containers. Any pertinent information should be sent to the Hearing Clerk, Food and Drug Administration, Room 4-65, 5600 Fishers Lane, Rockville, Maryland 20852, as soon as possible.

Department of Legislative
and Regulatory Affairs

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VRD 0002014463

Goodyear, Borden Sued for \$284 Million Over Polyvinyl Chloride Meat Wraps

By a WALL STREET JOURNAL Staff Reporter

CLEVELAND — A class-action suit against Goodyear Tire & Rubber Co. and Borden Inc. asking \$284 million in damages resulting from supermarket use of polyvinyl chloride meat wrap was filed in Cuyahoga County common pleas court here.

The complaint was brought by Florine Schultz, a former meat wrapper for Pick-n-Pay supermarkets, a Cleveland-based chain. It asks \$1 million in damages for

Mrs. Schultz and at least 283 other meat wrappers employed at 71 Cleveland-area Pick-n-Pay stores since the chain began using polyvinyl-chloride wrap in 1967.

The suit charges that the meat wrappers "endured chronic exposure to dangerous air contamination from thermal decomposition of polyvinyl-chloride films as it passed over an electric heat wire being used to cut said wrap for packaging," and that the exposure has caused respiratory, skeletal and cardiac injuries. The markets, the suit states, have used Prime wrap, a packaging film made by Goodyear, and Resinite, a Borden product.

In Akron, a Goodyear spokesman said, "Although we haven't been presented with a copy of the complaint, we are prepared to vigorously defend suits of this type." A Borden official also indicated the company hadn't received a copy of the complaint, and said public statements by Mrs. Schultz's attorney that there is a medically proved link between use of the wraps and physical injury are "without foundation."

The federal government this spring imposed strict regulations on exposure to vinyl-chloride fumes in plants making PVC, a solid plastic with many industrial and consumer applications, after exposure to the gas was linked to liver cancer among workers at certain plants. The supermarket meat wraps are made from a PVC resin.

The suit alleges that "as a direct result of inhalation of the highly toxic films" from cutting the meat wrap, "plaintiffs have incurred extremely irritating damage to the skin, eye, nose, and throat along with shortness of breath, coughing and general respiratory distress, which eventually leads to serious skeletal deterioration with permanent cardiac and brain injury."

Mrs. Schultz's attorney cited a University of California at Los Angeles study reported last November linking fumes from PVC wrap to respiratory ailments.

The attorney said that others exposed to PVC or vinyl-chloride fumes in use or manufacture of other PVC products, may later be added as plaintiffs in the suit. He also said other manufacturers of PVC products might be added as defendants, but indicated Mrs. Schultz hasn't any interest in suing the Pick-n-Pay chain, a subsidiary of Cook United Inc. until 1972, and currently privately owned.

In Chicago, a spokesman for the Amalgamated Meatcutters and Butcher Workmen of North America said the union has been concerned for some time about possible dangers connected with wrappers and has discussed PVC products with several manufacturers.

Robert Vandervort, an administrator for the National Institute for Occupational Safety and Health, said institute studies have linked use of the film to minor upper respiratory ailments, but that a connection hasn't yet been established between the wrap and more serious respiratory injury or other major illnesses.

Mr. Vandervort also indicated that PVC represents only a small proportion of fumes given off when the wrap is cut, and that much of the gas is a plasticizer, DI-2-ethyl hexyl adipate. He said that studies haven't pinpointed what chemical causes injuries, but that "probably both" are deleterious.

The institute is preparing recommendations on use of the wrap, he said.

VRD 800201464

THE WASHINGTON JOURNAL
Thursday, August 1, 1974

Clubs on Vinyl Chloride Seen for Food Packaging

WASHINGTON—The Food and Drug Administration plans to propose regulations to keep the hazardous chemical vinyl chloride out of foods, drugs and cosmetics.

The FDA rules would establish limits on the amount of the substance that could be contained in plastic packaging material or that would be permitted to migrate into the contents of the package. Vinyl chloride is a gas used to make the plastic polyvinyl chloride, which is widely used for packaging food and other consumer products.

The FDA regulations, which will be proposed for comment in a few weeks, would establish a maximum "tolerance" for leakage of vinyl chloride into foods, drugs or cosmetics of 50 parts per billion. Agency officials say this is the limit of present detection techniques.

A tolerance of 10 parts per million of vinyl chloride would be permitted in the plastic polyvinyl chloride. When the plastic is manufactured, vinyl chloride can be trapped as a contaminant.

Vinyl chloride is suspected as the cause of liver cancer, which has killed a number of employees in polyvinyl chloride manufacturing plants.

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Energy use in production of polymers and rubber goods					
(Trillion BTU's)	Fuel oils	Coal	Natural gas	Purchased electricity	Total
Synthetic resins and other plastic materials	33.4	29.0	55.8	102.8	221
Synthetic rubber	0.9	5.5	61.5	21.1	89
Cellulosic man-made fibers	7.5	46.3	8.8	5.4	68
Synthetic organic fibers	50.6	59.5	52.8	57.1	220
Tires and inner tubes	13.8	13.8	35.0	43.4	106
Rubber footwear	1.1	0.1	0.7	2.1	4
Reclaimed rubber	0.1	0.4	0.6	0.9	2
Other fabricated rubber products	15.0	7.1	29.9	36.0	88
Miscellaneous plastic products	7.0	1.7	46.7	117.6	173
Totals:	129.4	163.4	291.8	386.4	971

Fuels and electric energy used in U.S. production of synthetic materials (SIC 282) and rubber and plastic products (SIC 30) during 1973. Source: Foster D. Snell, Inc., subsidiary of Booz, Allen & Hamilton.

uct separations and other techniques.

Up to now, the Saxton group observes, cost-benefit studies have tended to favor the slightly higher operating costs of inefficient energy management over the increased capital investment necessary for the additional heat exchangers, longer distillation columns and other equipment associated with energy conservation. But now, the authors say, the ground rules have changed in two fundamental ways:

(1) Petroleum and other fuel prices have risen rapidly; hence, cost-benefit studies will shift toward favoring energy conservation.

(2) Allocation of fuels during a period of shortages will mean that an energy-efficient plant will be able to maintain output at a higher level than a plant with low efficiency in energy utilization; "and the margin for economic operations at reduced output is usually rather thin." Saxton says this aspect of conservation "makes it essential that those companies that have aggressively pursued energy reductions in the past not be penalized by allocations based on future conservation steps."

Plug for Coal: In the plastics and rubber industries, there could be appreciable substitution of coal for fuel oils and natural gas by 1980, according to the Foster D. Snell study.

Conservation of fuels and electricity by near-term measures to improve plant efficiency could reduce the rubber and plastics industries' total energy require-

ments by only about 5%, the Snell team estimates. This would be in line with trends already observed in these industries. For example, in plants producing polyethylene and other synthetic resins, consumption of Btus. per unit of production is expected to drop by 50% from 1962 to 1980.

The Btus. in Benzene: Industry people do not take issue with the general findings in these reports, but they do contend that the methods used in quantifying the various industries' energy consumption patterns have led to distortions.

In the report on industrial chemicals, for instance, feedstocks as well as fuels are measured in terms of each material's heat of combustion. The Petrochemical Energy Group, representing 18 producers of organic intermediates and derivatives, maintain that this method is inaccurate for some products and should not be used for determining any future regulations on allocation or pricing of petrochemical feedstocks. PEG says the energy actually consumed in producing benzene and shipping it to a customer is about twice that product's heat of combustion.

As of now, FEA is merely stockpiling these reports, along with the written comments that have been sent in by PEG and other industry groups. If new regulations are needed, the reports will undoubtedly provide useful background, but the industry comments make it clear that detailed and up-to-date testimony from industry experts will be indispensable.

Building safer PVC units

B.F. Goodrich demonstrated last week that it apparently doesn't expect the Labor Dept.'s Occupational Safety and Health Administration to promulgate its proposed "no detectable level" standard for worker exposure to vinyl chloride monomer (*CW*, June 26, p. 14).

While testifying at OSHA's VCM hearings in Washington last week, Goodrich Vice-President of Manufacturing John L. Nelson said the company has begun construction of a polyvinyl chloride plant in Louisville, Ky. The plant, to go into production in mid-1975, will significantly reduce VCM exposure, Nelson stated, but still will not be capable of reaching the proposed no-detectable-level standard (see also p. 30).

The new plant will incorporate Goodrich's latest PVC technology and will have several features that will result in a reduction in VCM exposure, according to Nelson.

Polymer reactors to be installed in the plant will be larger than those in the company's five other PVC installations. Goodrich contends that the larger reactors will have about 87% fewer VCM leak sources than those now in use. Other safety factors, according to Goodrich: greater use of computer controls and the fact that the plant will be an "outdoor" operation.

The Louisville plant will be located on the property where the company now operates a PVC plant, which was built in 1937, a Goodrich spokesman relates. He adds, however, that the new installation is meant to supplement, not replace, the old plant.

It was at the existing Louisville plant that the link between worker exposure to VCM and the rare liver cancer, angiosarcoma, was first reported in January. A search of employee medical records had revealed two deaths attributed to angiosarcoma. Investigations at PVC and VCM plants of other companies turned up several more cases of the disease. Angiosarcoma deaths of former employees of the Louisville PVC plant now number five, Goodrich says, and two other cases have been reported.

Temporary Standards: Concern about incidents of angiosarcoma at installations of Goodrich and other companies prompted OSHA to impose a temporary 50-parts-per-million emergency standard in April for VCM exposure. The agency's next step was to order the proposed no-detectable-level standard.

VCM and PVC producers have con-

Disputed data: How much can CPI cut energy use?

FEA gets a tally on industrial consumption of fuels but still may not know the score. Petrochemical group urges the agency not to make rules based on contested figures

Executives in the chemical process industries are uneasy about the dossiers that the Federal Energy Administration has been compiling on their operations. Their worry: when the energy crisis heats up again, inaccurate or oversimplified data in those new FEA tally sheets may mislead the agency into drawing up unwelcome regulations on the use and conservation of industrial fuels and feedstocks.

"In some cases," declares the energy resources manager for one large chemical company, "the figures are off not by just 20%, as stated in the report itself, but by as much as 300%."

At this moment, of course, petroleum products have become relatively plentiful, prices have eased in international markets if not in the U.S., and there is no Congressional clamor for FEA to propound tough new rules for curbing fuel consumption. Accordingly, FEA officials now regard these energy use reports as a data bank to be accumulated for reference.

Keeping Options Open: The reports, which include recommendations for reducing wasteful or inefficient use of fuel and feedstock materials, were commissioned last winter when the Arab petroleum embargo prompted the U.S. government to adopt an emergency allocation plan and to consider more drastic measures, such as gasoline rationing.

And while the Nixon Administration continues to back its proposal for virtual self-sufficiency in energy by 1980, it can be expected to keep all its options open. But Eric Zausner, FEA's assistant administrator in charge of Project Independence, says the 16 industry studies are not now counted as a vital element in that project.

The studies were requested by Treasury Secretary William Simon when he was head man in the energy office, but they were sponsored by the U.S. Commerce Dept.

By last week, FEA had received the reports, in final or draft form, on 10 industries: industrial chemicals, polymer and rubber products, petroleum refining, paper and lumber, hydraulic cement, iron and steel, food processing, coal mining, motor vehicles, and ground freight transportation.

Still to come are reports on pharmaceuticals, nonferrous metals, glass, plaster and concrete products, and contract construction.

Commended on Perspective: By and large, according to industry people who have read them, the reports do give a reasonably sound over-all account of energy consumption in these industries.

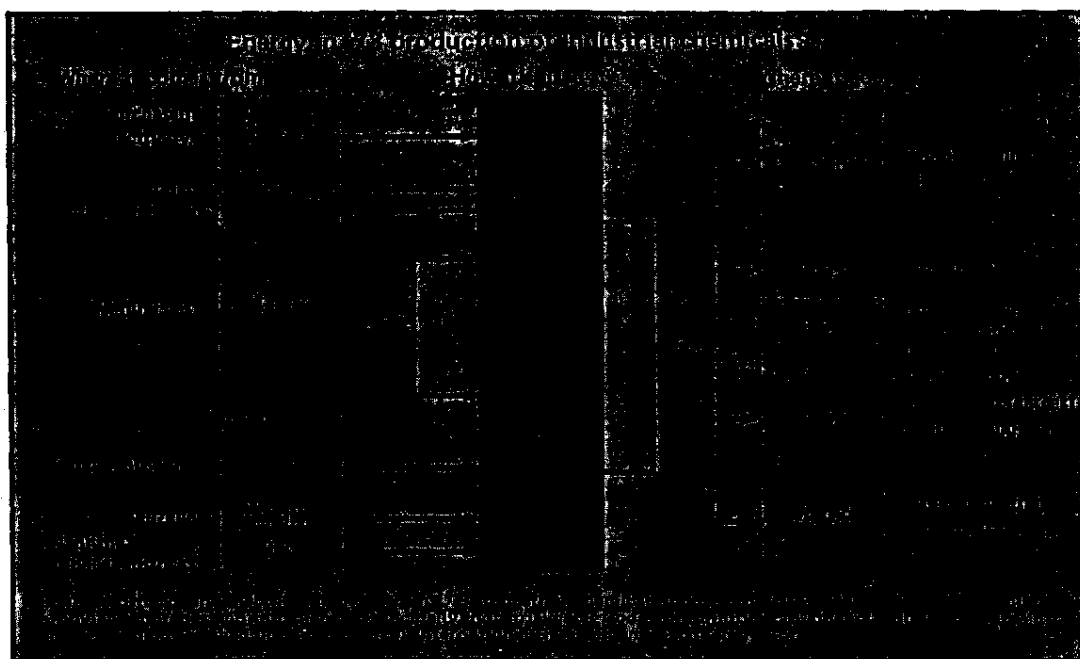
In the report on industrial chemicals, for instance, James C. Saxton and his associates at International Research and Technology Corp. (Arlington, Va.) point out that while this industry turns out more than 1,000 products of economic significance, it uses more than 75% of its total energy budget to produce just 37 of those products (*chart, below*).

And the report authored by Joseph Ne-

mec, Jr., Herbert Terry and Stephen F. Nagy of Foster D. Snell, Inc. (Florham Park, N.J.), shows that 22.7% of all energy consumed in the synthetic materials and rubber industries is in the form of electric power purchased for use in the plastics industry's polymerization and molding plants (*table, p. 20*).

Where Cuts Can Come: In plants that produce industrial chemicals, Saxton says, the greatest opportunity for energy conservation lies in the area of turbine and boiler fuel use. Observing that leading producers such as Dow, Du Pont and Union Carbide have already reported achieving increased efficiency in these operations, Saxton estimates that similar improvements throughout the industry could save 67-79 trillion Btus./year on turbine fuels and 382 trillion Btus./year on boiler fuels.

"Taken together, the improved turbine and boiler fuel uses represent a potential 25.7% reduction in 1974 fuel requirements," the authors continue. "If there were no reduction in the 1974 feedstock energy requirements (estimated at 1,950 trillion Btus.), the savings in fuel use would mean a 12% over-all reduction in total energy requirements." They add that feedstock use can be reduced by improvements in reaction efficiencies, prod-



tended throughout the OSHA hearings that the proposed level is unrealistic. Most have recommended a compromise standard, such as that suggested by the Society of the Plastics Industry—25 ppm. by October 1975, with a time-weighted average of 10 ppm. for PVC plants and 10 ppm. plus a time-weighted average of 5 ppm. for VCM plants.

Goodrich declares that its VCM exposure levels have dropped from 35-40 ppm. at the beginning of the year to 12-14 ppm. now. The company says it is trying to limit exposure to a ceiling level of 25 ppm. and a time-weighted average of 10 ppm.

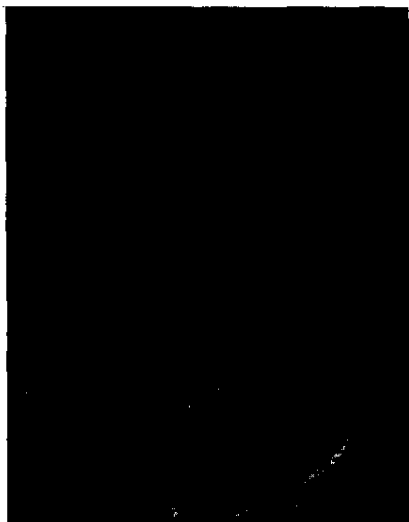
Nelson told OSHA that while Goodrich expects vinyl chloride exposure levels at the new Louisville unit to be lower than those currently existing in the company's other PVC plants, the actual levels will not be known until the new plant is in operation.

The process to be employed at the facility will be suspension polymerization. Both suspension and emulsion polymerization are used in the old plant, Goodrich says.

VCM will be shipped to the company's new operation by tank car from Goodrich's Calvert City, Ky., VCM production unit.

The company stresses that the preliminary engineering work on the new plant began in 1972—before the angiosarcoma controversy emerged—and that actual field construction was started early this year.

Expected capacity at the new installation and cost of the project were not reported by the company.



GOODRICH'S NELSON: Even for new PVC plant, 'no detectable level' is unfeasible.

Less urge to merge

The number of mergers proposed and completed by chemical, paint and coatings firms dropped 21%, to 23, in second-quarter 1974 from 29 in the same period last year, W. T. Grimm & Co. (Chicago) management consultant firm reported last week. There were 41 mergers in the first half, down 24% from the 54 recorded in first-half 1973, Grimm added.

Eight of the chemical, paint and coatings mergers in the second quarter were cash transactions, compared with nine in the same period a year ago. Stock was exchanged in one case, compared with four a year ago, and a combination of payment methods was reported in three cases, the same number as in last year's quarter, according to Grimm.

The number of drug, cosmetic and medical equipment mergers also dropped in second-quarter and first-half 1974 from the year before—to 14 from 19, in the second quarter, and to 27 from 37 in the first half.

Solid second quarter

Several early-reporting chemical companies have chalked up record second-quarter profits. They attribute the gains mostly to higher prices.

PPG's sales and earnings in the period were the highest in company history, according to Board Chairman Robinson F. Barker. Earnings were \$25.4 million, 5% ahead of the previous high set in same-period 1973. Sales were \$448 million, 16% higher than the \$385 million recorded in second-quarter 1973. Barker attributes the gains to higher prices and growing demand for energy-saving glass.

Allied Chemical's second-quarter earnings amounted to \$50.5 million (up 80% from same-period 1973) on sales of \$567.7 million (up 31%). Board Chairman John T. Connor says the company's energy, chemicals, fibers and fabricated products and export sales and earnings all contributed to the company's best quarterly performance ever.

FMC predicts second-quarter results will match the trend of the first quarter, when sales were \$477.2 million, up 20% from same-period 1973, and earnings totaled \$23.1 million, up 21%. Chairman and President Robert H. Malou says that full-year sales will rise 18% over 1973 levels, topping the \$2 billion mark for the first time.

Reynolds Metals boosted sales 48%, to \$530.6 million, in the second quarter, thanks to a market recovery for alumi-

num. Earnings skyrocketed to \$33.3 million, almost six times higher than same-period 1973.

Pluses in Paper: International Paper credits record production at its pulp and paper mills and price rises in many areas for its solid second-quarter results. Sales were up 25%, to \$763.4 million, while earnings jumped 61%, to a record \$75.1 million.

Crown Zellerbach reports a 10% increase in earnings and a 20% sales gain for the second quarter. President C. R. Dahl predicts 1974 will be a record year for the company, adding that sales "should break the \$1.6-billion barrier."

A "particularly outstanding" performance by Dart Industries' chemical group helped the company boost per-share earnings 30%, to a record of about 87¢, in the second quarter, according to President Justin Dart.

Akzona reports record sales of \$208 million, up 88% from same-period 1973, and record earnings of \$11 million, up 37%, in the second quarter. Claude Ramsey, chairman and president, says sales were limited only by plant capacity or raw-material shortages. He believes raw-material supplies will improve in the second half, but adds that "gains over the strong performance of the second half of 1973 will be increasingly difficult to achieve."

IP scraps merger

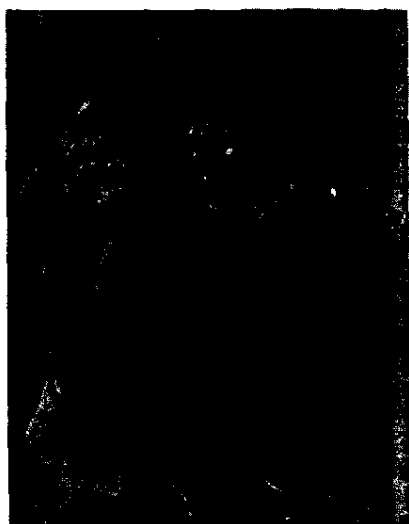
International Paper still wants to tap the potential 300 million bbls. of oil beneath about 2.9 million acres it owns, but General Crude Oil (Houston) won't be part of the deal.

IP made an offer early last month to buy General Crude for about \$437 million—a payment of \$45/share for General Crude common stock and \$180/share for preferred stock (*CW*, June 19, p. 23).

Initial response to the proposed merger seemed favorable. Pew Memorial Trust, which holds about 63% of General Crude's common, approved the deal. General Crude's directors would not commit themselves, however, promising only to take the matter under advisement.

Meanwhile, General Crude began discussions with other possible suitors. Then, IP reported it had withdrawn its purchase offer and "terminated the negotiations with respect to the transaction."

An IP spokesman declined to give details on why the proposed merger fell through but did say that development of potential oil lands "is still a priority intention here."



SENATOR McCLELLAN: 'Confused' law would lead to a weakened patent system.

Patent reform hits snag

The road to patent reform legislation continues rocky. As soon as the latest Senate bill on the subject cleared one hurdle, it ran smack up against several others.

Studies and proposals for patent reform have been in the works for eight years. Last fall, Senator Hugh Scott (R., Pa.) introduced S.2504, the Nixon Administration's bill (*CW*, Oct. 10, p. 20). That was turned over to the Senate Judiciary Committee's Subcommittee on Patents, Trademarks and Copyrights, which "marked up" (revised) the bill and turned it over to the full committee for a vote.

However, Senator John L. McClellan (D., Ark.), chairman of the subcommittee, made it amply clear that he did not like the Committee Print (mark-up) of S.2504. Instead of writing a minority report, he issued a scathing personal statement in which he said, among other things, "... our patent system will be weakened by enactment of legislation which is confused in purpose and deficient in execution." He was particularly pained that C. Marshall Dann, Commissioner of Patents, had been denied the opportunity of expressing his personal views on the matter.

Then, to confuse matters, Dann broke his silence with a 21-page letter to McClellan, acknowledging some of the new procedures would complicate the process "to some unavoidable degree." In general, Dann supports the Administration's proposals, although he, too, objects to parts of the mark-up.

Detailed Objections: Most knowledgeable patent people lean toward McClellan's view. Their objections are many. But basically the consensus appears to be that the proposal is too detailed, attempting to legislate in areas that are better left to Patent Office regulations. Many feel that the bill would throw enormous roadblocks in the way of obtaining a patent, that it would raise the cost of obtaining and maintaining a patent significantly. The net effect, they fear, would be to encourage secrecy rather than patents.

Objections to the S.2504 mark-up can be expected to become vocal. What impact this will have on the deliberations by the Senate Judiciary Committee and full Senate is difficult to assess. But chances of a patent bill passing through Congress this session are slim. Reason: The House Judiciary Committee, which would have to approve a House version, is too involved with impeachment considerations to take on patent reform. Opponents fear, however, that the bill might sail through the Senate, generating momentum that would make for early passage next session.

No goodbye Columbus

Production resumed last week at Borden's Columbus Coated Fabrics plant (Columbus, O.) following settlement of a strike that had idled the wall-covering operations since February.

With the settlement, Borden rescinded a decision, announced last month, to move the entire operation to Andover, Mass. However, about half of the operation has been transferred to Andover, resulting in the loss of about 250 jobs at Columbus.

The strike began when negotiations between the company and Local 487 of the Textile Workers of America broke down over the issue of wages. Shortly after the strike began, Borden stated that it would have to close the Columbus unit completely unless a settlement could be reached quickly.

The impasse continued for several months, with the company refusing to yield to strikers' demands and union officials charging that the company was unfairly trying to pressure a settlement.

Then, on June 29, an agreement on wages was reached with most workers, and on July 1 there was agreement with the others. The settlement calls for a \$1.30/hour increase during the next three years.

"I'm not happy with the terms of the

new contract," says Corwin Smith, president of Local 487. "But, under the circumstances, I think we have something we can live with for three years and keep the company from moving jobs away from the plant here."

Closing Shop: As the Columbus Coated Fabrics plant swings back into operation, another chemical process plant is shutting down for good. Litton Industries reported last week that it will liquidate assets of its Hewitt-Robins subsidiary's unit in Buffalo, N.Y.

The plant, which produces industrial rubber products, has been closed since March by a strike involving about 475 members of the United Rubber Workers. Litton tried unsuccessfully to sell the plant to at least a dozen companies, according to a spokesman.

Alcoa set for expansion

Because of increasing demand, Aluminum Co. of America said last week, the smelting capacity of the company's Badin, N.C., plant will be expanded by 50%, to 180,000 tons/year of primary aluminum. Cost was not disclosed.

Alcoa says the project, expected on-stream by mid-1976, will include a third potline and supporting facilities. The work force at the plant, now 680, will rise to around 830.

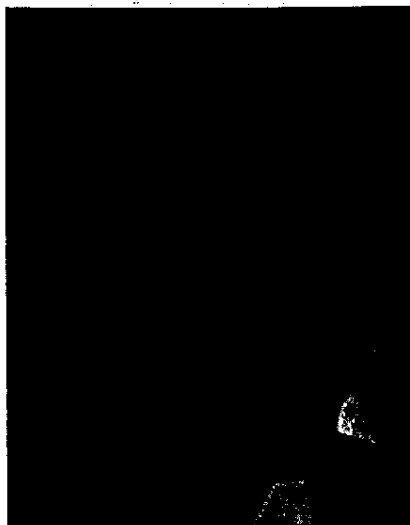
A spokesman says the expanded plant will not use the company's new electrolytic process for converting aluminum chloride into aluminum, but will use the conventional Hall process. Its aluminum chloride method, he explains, is still being developed by the company at a Texas pilot plant.

Power for the enlarged facility will be provided by local utilities, and the bauxite will come from Alcoa's world resources, the spokesman says. No reason was given for choosing the Badin site for expansion, but relatively cheap power in the area might be a factor. Alcoa says its domestic smelters are now operating at 100% of their 1.57-million-tons/year capacity.

In another aluminum-related development, Continental Oil (Conoco) said last week that it would construct a \$10-million, 40-million-tons/year high-purity-alumina plant at its Lake Charles, La., complex. When completed in 1976, the unit will produce CATAPAL SB, a highly active form of high-purity alumina used as a catalyst support in all major refining and petrochemical catalytic applications. Conoco now makes the product in a 20-million-lbs./year plant in West Germany.

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People: Italy's Cesare Maltoni



Cancer sleuth longs for simple life

For the man who launched a chemical industry cause célèbre by demonstrating the link between cancer and exposure to vinyl chloride (*also see p. 30*), Cesare Maltoni is singularly unchanged by sudden fame. The wiry, 5-ft., 9-in., dark-haired, dark-complexioned Italian is a 44-year-old bachelor who remains married to his work in preventive cancer research and seems to enjoy a certain loneliness.

As one observer notes, he runs his laboratory at the Institute of Oncology of the Hospital of Bologna "with the strictness of a bank." His voluminous records of doses, times of exposure, conditions, reactions of rats, etc., are immaculate and precise.

Yet, the large old summer house in

which he lives just outside Bologna is set in shaded grounds that are noticeably unkempt. The long grass is filled with varieties of wild flowers, predominantly poppies. Two large dogs guard the grounds. "I like the naturalness of it," Maltoni says.

Research First: He claims that his work with exposure of rats to vinyl chloride marks the first time a form of cancer, and its cause, has been predicted before it was recognized in man. Maltoni's work, sponsored by four European chemical companies (ICI, Montedison, Solvay and Rhone-Progil), had uncovered the cancer link more than a year before the first of 19 cases of angiosarcoma, a rare liver cancer, was tied to plant workers' exposure to vinyl chloride. And he is critical of the U.S. government and the Manufacturing Chemists Assn. as being "needlessly slow" in reacting to what he calls "conclusive laboratory proof." Three MCA representatives had visited Maltoni's lab in January 1973; angiosarcoma in PVC workers was not reported until January 1974.

He actively promotes the concept of more predictive cancer research as opposed to treatment studies. "Most cancer research is in therapy," he says. "Prevention is new and more difficult because it's always in conflict with something. But we have to fight. No longer do we have to wait for carcinogenic evidence in man. When the damage starts, it's too late."

Maltoni hopes his findings will give laboratory testing of animals new popularity. "Too often laboratory tests are done merely to prove the carcinogenic effects in animals of agents that have already proved to be carcinogenic for man. This merely amounts to saying that people die of cancer," he says.

One of Maltoni's prime concerns is the number of potentially harmful products that are made available for human use "without adequate testing. The human progeny could suffer irreparable damage within 100 years if we go on like this."

He concedes that every new product can't be tested immediately, but suggests starting with the most widely distributed products. "I would like a rule that new materials be tested for carcinogenicity before being released into the human environment," he says. (In the U.S., the Senate version of the toxic substances control

bill includes such a provision.)

Maltoni is suspicious of all compounds with a carbon-chloride linkage, as well as asbestos and chromium compounds. He bases this suspicion on a "biological inference that, for the time being, I am keeping to myself."

Small-Town Roots: Maltoni was born in Faenza, then a small town near Romagna, nestled at the foot of the Appennine Mountains. The town is famous for colored tiles and pottery. And he has an excellent collection of the pottery in his home.

After schooling in Faenza, Maltoni went to the University of Bologna, where he studied medicine and specialized in basic oncology, the study of tumors. Upon graduation in 1954, he spent a few years in Paris, studying experimental cancerology at the Institut du Radium, Section Fondation Curie. Between 1959 and 1961, he did cancer research at Chicago's Michael Reese Hospital.

He returned to Italy in 1961 and began his present job in Bologna. But his heart is in the provincial towns of Italy. "To a young person, the provinces can seem like a prison," he says. "But, as I get older, the more I realize that the values of provincial life are on a human scale. Faenza taught me all I know about human values. There, and in provincial cities like it, the death of a person becomes the death of a friend for everyone. All feelings are shared. Someday I would like to return there."

But before he returns to that simple life Maltoni will obviously be kept busy promoting the concept of preventive cancer research. In the future, if Maltoni has his way, all manufacturers of new chemical compounds may have to put product through the kind of rigorous testing he thinks could have prevented the angiosarcoma tragedies.

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CONCENTRATES

Science

Evidence of direct production of leptons was revealed in London last week at the 17th International Conference on High Energy Physics. Three groups working independently at the Fermi National Accelerator Laboratory, Batavia, Ill., have observed electrons and muons (heavy electrons) emerging from collisions of 300-b.e.v. protons with atomic nuclei. The detected leptons occur only once in about a million collisions. But this is still many times larger than predicted by the theory that protons are made of quarks. The ultimate implication is that the three subatomic forces—strong force, electromagnetic force, and weak force—may not be as different as they had seemed.

Plans for the world's largest transit radiotelescope have been scrapped. The unit, which was to be sited in Wales, would have had a 375-foot-diameter dish remotely controlled from the University of Manchester's radioastronomy department at Jodrell Bank 70 miles away. Soaring costs would put construction at about \$40 million, in contrast to the \$15 million or so that was estimated 18 months ago.

Immobilized enzyme synthesis of keto acids is the goal of a new two-year study at Battelle-Columbus. Research has shown that adding keto acid analogs of essential amino acids to the diet of uremic patients helps maintain proper nitrogen balance and reduces the need for dialysis. However, conventional chemical approaches are too complex and expensive to provide the 60 to 100 grams needed per patient per day. Battelle hopes to produce keto acids in larger quantities at lower cost by converting amino acids to keto acids with stabilized oxidative enzymes.

Dr. Veniamin Levich may be allowed to leave the U.S.S.R., after applying to emigrate since March 1972. According to the Committee of Concerned Scientists, the noted electrochemist's two sons have been told that they can leave for Israel this year and that he may be permitted to follow "by the end of next year." Harassment and denial of employment to Dr. Levich have aroused wide protests by U.S. and foreign scientists.

Education

A doctoral engineering program oriented toward actual practice instead of research will be offered this fall at Texas A&M University. The program will combine courses in engineering with business management and other courses designed to help engineers perform in industrial, political, and social arenas, according to the school's engineering dean Fred J. Benson. The program will emphasize complex engineering problems and will include a one-year engineering internship in government or industry instead of a dissertation.

Technology

A disposable, artificial kidney using hollow cuprammonium rayon fibers for blood dialysis is being commercialized by Japan's Asahi Chemical Industries. The firm claims dialysis efficiency two to three times that of existing devices (which typically use membranes of cuprammonium film or triacetate hollow fibers). The unit's low blood-side pressure drop enables use without a pump.

Vinyl chloride can be removed successfully from plant exhaust air streams using granular activated carbon, according to laboratory tests by activated carbon producer Calgon Corp. In the studies, using 33% vinyl chloride in air at 75° F., a 12 X 30 mesh activated carbon removed vinyl chloride to nondetectable amounts, Calgon says, and had adsorbed 30% of its own weight of the monomer when breakthrough occurred. Steam stripping removes the vinyl chloride from the carbon.

Avoiding any possible impact of dyes on man and environment will be the focus of the newly formed Ecological and Toxicological Association of the Dyestuffs Manufacturing Industry. Formed by a number of dye producers, mostly European, the association will be headquartered in Basel, Switzerland. It will make scientific information and technical know-how available to officials and agencies involved in drawing up laws and regulations relating to environmental and toxicological effects of dyes.

New solar cell technology has generated a new company to develop it. The company, to be formed under an agreement between Tyco Laboratories, Waltham, Mass., and Mobil Oil, will develop Tyco's "edge-defined, filmfed growth" process for producing silicon ribbon used in making cells to convert sunlight directly into electricity. Mobil Oil will provide up to \$30 million for the several-year development program.

A new plastic that can withstand temperatures up to 800° F. and is stable at 700° F. has been developed by scientists at Hughes Aircraft Co. under auspices of the U.S. Air Force. Describing the material, HR-606, as a new class of addition-curable polyimides, Hughes says it can be used either as a laminating resin or an adhesive, or it can be mixed with other materials and molded to form structures. Key to the polyimide's performance is its curing behavior—it doesn't give off gases that would form voids or weak spots, Hughes says.

Japanese cement sintering equipment will be built and sold by Fuller Co. under a nonexclusive license from Ishika-Wajima-Harima Heavy Industries, which developed the design jointly with Chichibu Cement Co. (C&EN, Aug. 21, 1972, page 14). A proprietary furnace between a conventional preheater and kiln, says IHI, cuts total fuel demand by 5 to 10% and doubles the kiln's capacity.

July 15, 1974

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Goodrich Discusses New Unit: PVC Makers Begin Changes

At last week's Occupational Health and Safety Administration hearings in Washington on vinyl chloride, Goodrich revealed publicly for the first time that it was constructing a "new facility" for the production of PVC in Louisville, Ky. (see news story P.4). The news was met with surprise in some quarters for, despite the great number of new plants coming on-stream in the next several months, Goodrich, the largest PVC producer in the world, has steadfastly maintained that it was not contemplating any expansions (other than a proposed plant in Alberta, see CMR 7-1-74, P.7).

Approximately 1 billion pounds of new annual capacity for the U.S. PVC industry is scheduled to be completed within the next year. There will not be enough monomer available to feed this new capacity, even if, as has seemed indicated in recent weeks, monomer producers are able to again operate at full potential. There is not enough monomer capacity, even announced, to support such broad PVC expansion, industry people have been saying. In addition, since the beginning of the year, VCM toxicity problems have suddenly cast far more troubling clouds over future PVC production capabilities.

The feeling has been that no monomer producer was going to invest any "megabucks", as one industry source said, in new plants until the OSHA problems were resolved, and that no PVC producer, unless already committed, was going to invest in new units until not only something happened at OSHA but until there was some significant change in the monomer supply picture. So it was strange, it seemed, for Goodrich, who was not committed - some thought luckily - to risky expansions for the time being, to announce that it was going to have a new facility on-stream in a year. It not only announced the new unit but announced it at the OSHA hearings themselves, saying at the same time that if OSHA's proposed non-detectable exposure rule were adopted it, Goodrich, would have to get out of the business.

NEW REACTORS

Contacted for more details about the new Louisville unit, a Goodrich spokesman said that the "new facility" would be housed in current plant buildings. The Louisville plant is one of the oldest in the country and also the site of discovery of the first American angiosarcoma deaths linked to vinyl chloride. The spokesman said that the new production potential being added consisted in the replacement of some older reactors by new, larger reactors. He added that the project amounted to "making more efficient use of (existing) buildings." Goodrich declined to call the project either an "expansion" or a "one to one replacement" of current potential. The company would say only that the project would result in "no significant increase" of total company capacity.

So the truth seems to be that Goodrich is not expanding, and they never claimed to be, but are instituting engineering changes which may not only be mandated by the mere age of existing units but also by the desire to get a head start on practical measures to reduce VCM levels. The larger reactors, as the Goodrich spokesman explained, contain less potential for leaking, having fewer valves, pumps, reducing venting operations, etc.

Producers who are scheduled to expand during the next few months are also known to be taking similar measures to build-in some safeguards in anticipation of OSHA regulations, which most feel will be less strict than that proposed. Robintech, who with Shin-Etsu is constructing a 220 million pound plant in Freeport, Tex., says that it is also going to use larger computer controlled reactors to reduce emission potential. A spokesman for Certain-TEED, which is completing its first plant (300 million pounds) in Lake Charles, La., says that engineers are going through the facility and making changes in anticipation of stiffer rules.

This spokesman points out that new plants may have to be particularly careful about air levels, for, in his view, while operating plants may be given deferrals in achieving whatever reduced air levels are finally put into law, new plants may not be able to operate at all until full compliance is achieved. In this view the engineering advantages owned by companies with new plants making it easier for them to adjust to regulations may also make them more liable than companies with older plants for failure to achieve early compliance with those regulations: Georgia Pacific, another company entering the PVC market for the first time, with a 220 million pound plant in Plaquemine, La., declined to be specific about engineering safeguards being built-in to their first plant, but a spokesman said that the facility "will be safe in every detail."

Another engineering change, besides larger reactors, which may become popular in the future in response to VCM regulations is the bulk process of production which is now only used exclusively by Hooker. Bulk process involves no water and consequently no VCM effluents. It is also said to leave up to one-third less residual monomer after polymerization than suspension and dispersion processes. These could be important advantages.

Goodrich's announcement last week, then, points up the action industry is anxious to take in reducing VCM levels in anticipation of regulation, while calling for easier "technically feasible" regulations, and rather than being what seemed a response to former (ancient) market conditions - expansion, it is an early response to the new market era - reprocessing:

CHEMICAL MARKETING REPORTER
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OSHA Proposed VCM Rule Too Stringent

Chemical industry witnesses last week warned that the proposed Occupational Safety & Health Administration standard covering the exposure of workers to vinyl chloride monomer is too stringent and will cause great economic consequences for the industry and its workers if adopted. The statements came from a long list of industry witnesses as the OSHA hearing in Washington continued into its second week.

John L. Nelson, vice-president of manufacturing for B.F. Goodrich Chemical Company, the industry's largest PVC maker with 930 million pounds of capacity at five plants, as well as a billion pounds of monomer capacity at Calvert City, Ky., told the hearing a no-detectable level of VCM in its operations is not technically feasible nor is full-time use of respiratory protection by workers.

He says the company will be forced to shut down its PVC and monomer operations if the standard is adopted. Goodrich, he says, has embarked on a multi-million-dollar program to generate new technology which might make possible further reductions in levels of vinyl chloride exposure.

The American Chemical Society, however, took issue with industry spokesmen and endorsed the "no detectable" standard. In a statement given by Dr. Stephen T. Quigley, ACS pointed out the lack of available data establishing a safe level of exposure to vinyl chloride and concluded that "even the potential threat of exposure to vinyl chloride justifies the adoption of the proposed standard."

Dr. Walter Harres of Uniroyal, Inc., representing the Rubber Manufacturers Association, said that "no prudent manufacturer, knowing that VCM is capable of causing cancer, will expose men at concentrations likely to cause harm."

However, he asked OSHA not to overlook our competitive system. A new criterion, he

explained, has entered the marketplace and the energies of the large companies will be turned loose to solve the problem. He asked what is available to take the place of VCM and urged OSHA to keep the standard as simple as possible.

Richard P. Carter, director of government relations, environmental affairs, for Johns Manville, Inc., expressed concern about two distinct goals of the standard.

On the one hand, he said, there is the recognized necessity to protect workers exposed to potential hazardous amounts of VCM and on the other hand that PVC resin has become "a critical component in an enormous variety of products upon which a substantial portion of our economy is dependent."

He urged OSHA achieve a balance between the two factors in its final standard.

He also expressed concern that the standard could well result in stopping or reducing the available resin available for the firm's PVC pipe and pipefitting plants, resulting in closing those operations and with the elimination of 860 jobs. Johns Manville would lose about \$91 million in sales and investments of about \$41 million in its PVC pipe and pipefitting units, he said.

From data submitted at this hearing, he said, there is reason to believe that it would be both economically and technologically unfeasible for both the VCM and PVC resin industry to comply with the proposed standard by Oct. 5, 1974, or reasonably soon thereafter.

Robert I. Martin, president of Rimar Manufacturing Co., a processor and fabricator, expressed deep concern about the result that the standard would have on the small fabricator and that it could result in pricing them out of the world market.

Louis J. Bibri, vice-president of Armstrong Cork Co., a larger user of PVC resin, said that the proposed standard was not written with compounder and fabricator in mind. He pointed out that there is a vast difference between VCM and PVC resin and suggested that performance standards would be more meaningful.

He suggested that OSHA recognize the difference between the types of manufacturing operations and employer exposure.

Conflicting views on vinyl chloride coalesce

Industry decries OSHA's no-detectable level rule as unnecessarily harsh; both labor and ACS support proposed standard

Mere mentioning of the words vinyl chloride to Occupational Safety and Health Administration officials who presided over public hearings on the agency's proposed permanent workplace standard for the chemical may well lead to mutterings that enough is enough. In nine days, the officials listened to 35 hours of direct testimony by 44 panels of witnesses—and many additional hours in question and answer sessions—and received 89 written submissions for the hearing record. Much of the data presented OSHA is conflicting. All this is of little comfort to the officials as OSHA has until Oct. 5 to come up with its final version of a permanent standard.

It's likely that OSHA may well pick some middle ground standard—tougher than that proposed by industry, softer than that initially proposed by the Government—which, if either labor or industry is unhappy about it, may well be challenged in the courts anyway.

Data presented at the hearings tended to coalesce, in effect, into two positions: that of industry and that of Government-labor-ACS. For instance, a spokesman for the Society of the Plastics Industry maintained that OSHA's proposed work-place standard—which, among other things, calls for a no-detectable level of vinyl chloride—"is not technologically feasible and, if adopted, would shut down the industry." In contrast, Peter Bommarito, president of the United Rubber Workers, said that the "OSHA proposal comes closer to the ideal standard than any yet proposed or promulgated for any workplace hazard."

However, Dr. Daniel P. Boyd, director of the office of standards development for OSHA, although emphasizing that the proposed standard is just that—a proposal—said that "it represents our best judgment based on the information available on May 10... our present judgment is that vinyl chloride is a carcinogenic agent." Dr. Boyd pointed out that in protecting employees from a carcinogenic material, "We are operating in the area of many unknowns.

For example, we do not know the mechanism by which a chemical carcinogen operates or whether a safe level of exposure can be set." Much of the testimony presented at the hearing dealt with industry's, labor's, and research workers' effort to resolve the latter question.

The initial impetus for the vinyl chloride industry came during World War II when it was used as a substitute for natural rubber. According to Dr. Irving J. Selikoff, professor of medicine at City University of New York's Mount Sinai School of Medicine, "This immediately points to a problem of current vinyl chloride-polyvinyl chloride investigations; the industry is a relatively young one, and the late effects of toxic exposure have only begun to appear; most of our experience is still ahead of us." He told the hearings that clinical field studies are being conducted that include examinations of more than 1200 vinyl chloride-PVC polymerization workers. Although all the results are not yet in, he reported that studies of 354 current and former workers at Goodyear's plant in Niagara Falls, N.Y., "demonstrated a significant prevalence of liver abnormalities, peripheral vascular changes, and lung abnormalities."

Information on deaths from two plants, one which produces monomer and the other polymer, was presented by Dr. John M. Peters of the Harvard School of Public Health. He said that studies on 161 deceased white males showed "a 50% excess of deaths due to cancer." There was a "60% excess of lung cancer (13 cases with 7.9 expected) and a 320% excess of brain cancer (five cases with 1.2 expected) with the

number of liver cancer cases being 10 times those expected in a similar unexposed population. He stressed that these studies, though preliminary, show that multiple cancer sites are involved and cancer is increasing over time in the population. Dr. Peters agreed with Dr. Selikoff in that he said, "I do not believe we will know the full cancer-causing potential of vinyl chloride for several years. At this point the only way to assure an end to this serious hazard is to eliminate the exposure."

The vinyl chloride-PVC industry, in general, took the opposite view. Harry E. Connors, vice president of Diamond Shamrock Chemical, told the hearings, "In our judgment the cases of worker illness recently discovered in industry are the delayed result of conditions that were common many years ago but are no longer present in today's plants." Dr. Richard W. McBurney, corporate medical director of Diamond Shamrock Chemical, pointed out that "during the early years of PVC production attention was given to vinyl chloride vapors only because of the anesthetic qualities and the explosion hazard. Since the explosion hazard occurs at upward of 30,000 p.p.m. and the anesthetic effect at 1000 to 5000 p.p.m. the vinyl chloride levels in work areas were undoubtedly quite high."

Dr. Carl U. Dernehl, associate medical director of Union Carbide, told the hearing of a health survey conducted by SPI covering 16 plants employing 2372 persons whose current work permits exposure to vinyl chloride, plus 471 who had worked with it in the past. He said that the study identified 1402 men who were exposed to vinyl

SPI's vinyl chloride rules would differ sharply from OSHA's

OSHA

OSHA's proposed standard for vinyl chloride is based on the assumption that the chemical is a known human carcinogen. The standard is designed to protect workers from the health effects of vinyl chloride, which are known to include liver cancer, lung cancer, and non-Hodgkin's lymphoma. The standard is based on the latest available scientific data, and is intended to be as strict as possible while still being technologically feasible. The standard is based on the following assumptions:

- 1. Vinyl chloride is a known human carcinogen.
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chloride at least 10 years ago, of which 416 had a latent period of more than 20 years. Also identified were 787 men exposed continuously to vinyl chloride for more than 10 years, with 104 being exposed for more than 20 years. Dr. Dernel said, "Examinations of these men have failed to show the existence of abnormal liver function tests in greater proportion than would be found in a control population. There is no case of angiosarcoma of the liver among these men even though their exposure time is sufficient for the disease to have occurred and exposures are believed to have been in excess of 50 p.p.m." He concluded that "these data fail to support the need for an exposure level as drastic as that proposed in the standard."

The SPI survey's findings were supported by Diamond Shamrock, Dow Chemical, B. F. Goodrich, Tenneco Chemicals, and Firestone. All reported that despite extensive surveys of their current and former vinyl chloride-PVC workers, no further cases of or deaths due to liver cancer have been found, other than the 13 previously reported to OSHA.

Industry also felt that the proposed standard was too far-reaching. According to Anton Vittone, president of B. F. Goodrich Chemical, "The production of vinyl chloride, its polymerization into PVC resin, and the processing of PVC resin into semifinished or finished products is treated in the proposed standard as one industrial health problem." However, he contended, "Each is an entirely different operation posing its own problems, permitting and requiring different solutions."

Of particular concern to many industry witnesses was the inclusion of PVC processors and fabricators, such as phonograph record makers, under the proposed standard. Monitoring data on vinyl chloride exposure in processing plants were presented by several witnesses, including Philip J. Weaver, director of industrial affairs for B. F. Goodrich. In a conclusion that agreed with those of other witnesses, he said, "Our data does not support this concept of inclusion of processor operations" under the proposed standard since "we find no detectable levels of vinyl chloride in most of the processing work places."

In addition to urging that fabricators and processors not be included under the permanent standard, the Society of the Plastics Industry proposed that in vinyl chloride and PVC plants there be a stepped reduction in worker exposure.

This is in sharp contrast to the American Chemical Society position presented at the hearings by Dr. Stephen T. Quigley, head of the Society's department of chemistry and public affairs, and Howard H. Fawcett, chairman of the ACS Committee on Chemical Safety. ACS, in essence, supports the OSHA proposed standard, asking



PVC fabricators should not be included under the exposure standard, SPI urges

only that the standard be defined as a minimum practical level capable of detection by a recommended method rather than as a non-detectable level.

SPI's proposed standard drew sharp criticism from Anthony Mazzocchi, citizenship-legislative director of the Oil, Chemical and Atomic Workers International Union. He said, "It will be a tragedy if OSHA adopts the so-called 'common denominator' kind of standard that SPI sponsored. Under this approach a standard is adopted that everybody can meet. But those plants that can go further are under no incentive, at that time, to do anything more."

Most companies at the hearing said that although it would be difficult, they could live with SPI's proposed standard. Two companies, however, reported that they are already operating at much lower levels. Dr. V. K. Rowe, Dow director of toxicological research in health and environmental affairs, said that the company, "is generally operating within an eight-hour time-weighted average (TWA) concentration of 10 p.p.m.; however, brief malfunctions and other temporary situations occasionally result in short-term excursions in excess of 10 p.p.m." And Air Products and Chemicals' John T. Barr reported that his company has an eight-hour TWA in the 20- to 25-p.p.m. range for workers in its polymerization building and even lower levels for those in other job locations. Tenneco Chemicals, however, estimated that it would have to spend in excess of \$10 million to reach the exposure levels recommended by SPI.

Vinyl chloride-PVC industry witnesses contended throughout the hearings that meeting the proposed standard was just not technologically feasible, unless workers wore air-supplied respiratory equipment all the time. However, Calgon Corp., which was moved from 20th to last on the witness list, declared that technology was available to remove vinyl chloride from the air. William Lovett of the company's activated carbon division said that the monomer can readily be adsorbed on activated carbon in con-

centrations ranging from 1 p.p.m. more than 30% by volume in air. He said laboratory results show that 100% removal of vinyl chloride from air in nitrogen streams is technically possible using dual beds.

Earlier in the hearing Tenneco Chemicals testified that it has included carbon adsorption to recover the monomer from two small process streams, neither of which contains air, in plans for its new PVC plant in Pasadena, Tex. However, it pointed out that it considers this activated carbon method to be "wholly impractical" where large volumes of air and small concentrations of vinyl chloride are involved.

Mr. Bommarito expressed the belief that the standard can be met, saying that where "engineering controls may not be applicable, personal protective equipment can be used." He added that especially in newer plants the problem is "characterized by the will, not the ability, to do the job." He concluded that "the medical facts are in and the problem is now in the social and political arena."

International U.S. reactor design loses out in U.K.

U.S. reactor design has lost out in its bid for the next generation of nuclear power stations in the U.K. The British government has opted instead for the steam-generating heavy-water reactor (SGHWR) system. The immediate plan is to build three twin-reactor stations with an overall capacity of about 4000 Mw. of electricity. The first of these stations should be operating by 1982.

The decision, taken by Eric Varley, U.K. Secretary of State for Energy, bucks the trend in other countries, where planned nuclear power programs center on U.S. designs for light-water reactor (LWR) systems, either General Electric's boiling-water reactor (BWR) or Westinghouse's pressurized-water reactor (PWR). Indeed, at public hearings before the Energy Resources Subcommittee of the House of Commons Select Committee on Science and Technology last December, both Arthur Hawkins, chairman of the Central Electricity Generating Board, which supplies power to England and Wales, and Sir Arnold Weinstock, managing director of British General Electric, which has a 50% stake in U.K. National Nuclear Corp., came out strongly in favor of LWR's, primarily because the technology is already proven and can be fairly quickly brought into operation without major design and development effort (C&EN, Feb. 18, page 11).

Mr. Varley cites a number of reasons for deciding on the SGHWR route. "In the government's judgment, it will provide power reliably and we can proceed

VRD 0002014476



To ~~FK~~ JDB LNV KLS RDW
From D. V. Porchey

Date 7-26-74

Washington Post, July 20, 1974.

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John Herling

Protecting Workers— And Their Jobs

Like God's angry man, Peter Bommarito, president of the Rubber Workers Union, stormed at leaders in the chemical and plastics industries for resisting stronger safeguards against cancer-producing vinyl chloride, a substance used in the manufacture of a wide variety of products.

"There are millions of workers—frightened men and women—who don't want to die for their jobs," said Bommarito, who is chairman of the occupational safety and health committee of the AFL-CIO Industrial Union Department which represents 6,000,000 workers in 60 unions. "They want to be told that industry management and union and the government, federal and state, can assure them of a job and their lives. They certainly want both," he continued. "But if this is not possible then they choose life."

Bommarito spoke to an occupational safety conference on vinyl chloride. The hushed audience in the Labor Department auditorium included representatives of management, government and unions. He made it clear he had no intention of bargaining with the health and safety of union men and women—although this has sometimes happened in the past.

Often, when stricter standards are advanced for the protection of the health and safety of workers in plants and/or mines, two things take place. First, the prospect of greater protection for workers scares the industry because of the expenses of implementing safety standards. Second, management warns that the cost of such improvements will be so prohibitive that plants will be closed and workers thrown out of their jobs.

What it comes down to is that workers are confronted with a dread choice: "Your wages or your life."

Based on experience, employers are confident that unions and their leaders, threatened with unemployment, will make some face-saving compromises. These are often filtered through a screen of confusing statistics, to reassure workers that at least for the time being they have no medical cause for alarm.

But Bommarito was having none of that. Like the Oil, Chemical and Atomic Workers, his union has been one of the pioneers in insisting that management must not duck responsibility maintaining safe work places. Bommarito says he has had a bellyful of

Mr. Herling writes frequently on labor topics for these pages.

management's tactics of delay and poor-mouthing of its financial ability to cover the costs of protection.

What it amounts to, he said, is that the "nation is being blackmailed" by managements resisting the application of new effective health standards. They raise the specter of "an end to 1.6 million jobs and national disaster."

Bommarito's voice grew sharper:

"He made it clear he had no intention of bargaining with the health and safety of union men and women."

"This country survived for nearly 200 years without polyvinyl chloride (PVC) and we can survive in the future without it. If PVC cannot be made or used safely, then the proposed standard must be replaced by an orderly procedure to phase out vinyl chloride production and find substitutes for its products, or to phase out the products themselves. This is not an easy position to take. But there is no alternative."

The battle over vinyl chloride is the latest confrontation between labor and industry on the subject of protection for workers against cancer-producing chemicals. Battles over asbestos and carcinogens continue to be fought in Congress and in the courts. Labor, said Bommarito, has listened to experts from all over the world and "we have concluded that the proposed government standard of 'no detectable level' for vinyl chloride is both necessary and feasible."

Bommarito concluded: "The issue before us is really not the control of vinyl chloride. The issue is whether life has a higher value than dollars, whether we will permit corporate structures to run the country without control. The language and the intent of the Occupational and Safety and Health Act mean that workers' lives no longer can be sacrificed for financial gain. The vital organs of our bodies are not for sale."

CONOCO

NRD 0002 14478

To ✓ FK JDB LNV KLS RDW
From DVP

Date 7-26-74

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Washington Post, July 23, 1974

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Brennan Won't Prod HEW to Soften Standards

7/22/74

VRD 0002014475

Job Safety Rules Debated at Hearing

By Bob Kuttner
Washington Post Staff Writer

Labor Secretary Peter J. Brennan, testifying at a Senate hearing yesterday, promised that his department would not pressure the Department of Health, Education and Welfare to water down scientific recommendations on work-place hazards.

Under federal job safety legislation enacted in 1970, scientific findings by HEW's National Institute of Occupational Safety and Health (NIOSH) are supposed to be the basis for Labor Department

regulations limiting worker exposure to hazardous substances.

Recent published interviews with two Labor Department officials indicated that Labor's Occupational Safety and Health Administration found the HEW reports politically embarrassing, since the HEW recommendations are often more stringent than the standards the Labor Department wants to adopt.

According to sources at HEW, Labor Department aides have pressed NIOSH either to temper its scientific recom-

mendations on worker health with economic considerations, or to keep its findings confidential.

At yesterday's hearing before Sen. Harrison Williams' labor subcommittee, however, Brennan said economic factors were solely the Labor Department's responsibility; "we're not going to cede our responsibility to anybody," he testified.

The Occupational Safety and Health Administration is also under fire as a result of a 1972 election campaign memorandum made public last week by the Senate Watergate committee, in which former OSHA Administrator George Guenther suggested that worker health and safety enforcement could be used as "a sales point" for corporate campaign fund raising. Under questioning from Williams, Brennan said yesterday, "I don't know what went on in the past, but I can assure you it won't happen in the future."

However, Jacob Clayman, representing the AFL-CIO, said, "To this day, OSHA has never published a standard they have not been forced to publish."

Standards regulating worker exposure to asbestos, vinyl chloride and other cancer-causing agents, Clayman said, were issued only as a result of trade union petitions, and 15 other standards recommended by HEW have not yet been issued.

At the same time, OSHA has received bitter criticism from small businessmen who contend its standards are too tough.

Last month, the House approved an amendment exempting small businesses from worker health and safety regulations. The effect would be to exclude about 90 per cent of businesses and 30 per cent of the work force.

Both the Labor Department and the AFL-CIO oppose the amendment to the 1970 legislation.

Sen. Peter Dominick (R-Colo.) declared: "This act was supposed to be a remedial statute. It is not; it is a punitive statute."

Dominick told of a Colorado ski boot manufacturer who complained to the senator's office that OSHA was trying to put him out of business.

According to Dominick, the ski boot company was given less than a week to stop using a chemical which OSHA determined could cause cancer.

Dominick disclosed that he personally contacted Labor Under Secretary Richard Schubert to get a waiver for the company.

Schubert, asked about the incident, said Dominick had misunderstood OSHA's regulation. According to Schubert, OSHA merely required the company to take certain precautions when using the chemical, such as outfitting workmen with protective garb.

Dr. Sidney Wolfe, director of the Ralph Nader-affiliated Health Research Group which has criticized OSHA as lax and politically influenced, said Dominick's anecdote proved his point.

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Tougher Vinyl Chloride Rules Are Goal By Fall as Labor Agency Ends Hearings

By a WALL STREET JOURNAL Staff Reporter

WASHINGTON—Labor Department officials said they hope to issue new, tougher standards for handling vinyl chloride by Oct. 5, when the current temporary standard expires.

The department yesterday completed nine days of hearing on the proposed standard barring exposing workers to any "detectable" amount of the chemical. The hearings consisted mainly of plastics industry testimony asserting the proposed standard would be impossible to meet and would close down much of the industry.

But the hearings ended on a surprising note when an official of Merck & Co.'s Calgon Corp. described laboratory work showing that vinyl chloride gas can be totally removed from air by filtering it through activated carbon, which Calgon makes. It can later be recovered and reused.

However, other industry officials at the hearing insisted that the findings didn't nec-

essarily show how the technique could be used in an industrial plant, or how expensive it would be to install.

The Labor Department in April issued a temporary standard cutting vinyl chloride exposure to 50 parts per million in the air, responding to evidence that exposure can cause cancer.

Daniel P. Boyd, director of the Office of Standards Development for the department's Occupational Safety and Health Administration, said the evidence at the hearings indicates a standard of 25 parts per million can be met "across the industry." He said the actual standard would be "somewhere between zero and 25." A "no detectable" level would be about one part per million.

"There isn't any likelihood in my mind," he added, "that we're going to put the industry out of business."

Forty-four groups of witnesses from industry and labor appeared at the hearings.

as does structuring the Federal Government into departments and agencies, each with a reasonably coherent mission. Certainly, it makes managerial sense. Unfortunately, this arrangement for federal R&D exhibits ... serious weaknesses."

Further, Dr. Handler said, "It seems to me that the time has come for the Congress and the Executive either to accept the general philosophy by which we have operated—or reject it. But not snipe at it annually. If such acceptance is politically unacceptable—although I do not see why—then let that be made clear so that we may proceed instead to erect NIRAS, as once proposed by this Committee, or go further and transform NSF into a Department of Science and Technology which is deemed politically supportable."

And so it went. The House committee is yet to hear from a host of witnesses, including all former Presidential science advisers. After drafting a bill to set up a council, the committee will hold a third round of hearings, with Administration science officials, including Dr. Stever, as the key witnesses. At that time, Dr. Stever, who has been getting high praise for an admirable job from critics of the present arrangement, will get a chance to say how well things have been going and whether he feels there ought to be a change, albeit within the constraints of being an Administration official.

ICI ends its silence on vinyl chloride

The argument over the handling of results from animal toxicity studies that have helped to establish an apparent link between exposure to vinyl chloride and a rare form of liver cancer in humans isn't over yet. The studies are being conducted by Prof. Cesare Maltoni, director of the Istituto Di Oncologia, Bologna, Italy.

In an earlier story (May 20, page 16) C&EN reported that the Manufacturing Chemists Association seemingly held in confidence from January 1973 until January 1974 scientific findings by Prof. Maltoni on vinyl chloride as an agent causing liver cancer in rats.

The story also raised the question of what an MCA group, which included an Imperial Chemical Industries physician, did, or did not, reveal about these rat studies during a July 1973 meeting with officials of the National Institute of Occupational Safety and Health (NIOSH). According to NIOSH director Marcus M. Key, the group made reference to neither Prof. Maltoni by name nor to angiosarcoma of the liver in humans and animals (C&EN, June 10, page 3). In May of this year, MCA released a "vinyl chloride chronology" that includes its version of the meeting (C&EN, June 10, page 12).

ICI, which had remained silent on

the issue, now has decided to come forward with a letter to C&EN that it hopes will be a constructive contribution to help clarify the situation. The letter, and NIOSH's response, follow.

Dear Sir:

Dr. Marcus Key, in a letter in your issue of June 10, 1974, describes a meeting between NIOSH and MCA on July 17, 1973. He refers to an ICI doctor who flew specially to Washington on this occasion to acquaint NIOSH fully with the results of a wide-ranging investigation on vinyl chloride monomer, currently being carried out by a group of European companies. Since certain of the phrases in Dr. Key's letter might be capable of misinterpretations, which I am sure he would not have intended, some comment from Europe may be helpful in clarifying these.

(1) Dr. Key reports that the ICI doctor "critically reviewed the work of Prof. P. L. Viola." This was an entirely proper review of the scientific criticism which had been made previously of Dr. Viola's paper and provided a possible explanation for the general lack of interest shown by the rest of the world in Dr. Viola's conclusion. The meeting provided a forum for the European group to outline the animal experimental work which it—alone—had sponsored in 1971 and to present its findings to date. The protocol for the new work had been designed to avoid any criticism similar to that directed at Dr. Viola. Dr. Key, of course, confirms this in his brief reference to "more reasonable levels of vinyl chloride," though this was by no means the only important difference between the new and old work.

(2) Dr. Key then reports the European representative as saying that "several tumors interpreted as confirmation of Dr. Viola's work had been observed." For complete clarity, this sentence needs a little expansion. Our doctor, in fact, reported that primary tumors at several sites had been produced and that this confirmed Dr. Viola's overall, and previously disregarded, conclusion that vinyl chloride was carcinogenic to rats. He did not say, as some of your readers might misconstrue Dr. Key's sentence, that we confirmed Dr. Viola's results in that vinyl chloride produced only Zymbal gland tumors metastatic to other sites. Such a statement would have been untrue.

(3) Dr. Key is correct in saying there was no discussion of angiosarcoma of the liver in rats at the meeting. Nor has anyone in Europe attempted to say that information was transferred in this specific form. As of July 1973, the major new development in European work, which contrasted with Dr. Viola's, was that vinyl chloride had proved carcinogenic to rats at several sites and at levels down to and including 250 p.p.m. To those concerned with the work, this conclusion had far greater

impact than the observation that one of the types was angiosarcoma of the liver, a form very rare in humans and unknown at that time in vinyl chloride workers. In his initial presentation, therefore, the European delegate presented the animal results in the generalized form that would make maximum impact, within a wide ranging survey of past and future activities.

The major facts were made clear. NIOSH was told that vinyl chloride caused multisited primary tumors in rats at concentrations down to 250 p.p.m. It also was told of a wide range of further actions already under way, in Europe and the U.S., as a result of this finding. The European doctor was fully prepared to provide any further detailed information, within this main statement, that NIOSH might ask for. That NIOSH asked for little more before the meeting ended indicated to MCA and the European group that both information and proposed actions were thought adequate and proper.

At that time and in the absence of a known human hazard, that was a reasonable conclusion for NIOSH to come to. When unexpected results first emerge in a long-term animal toxicological program, the normal and proper course of action is (a) to scrutinize further results to ensure that the first indications are significant, (b) to start new experiments aimed at a more precise definition of the effect, (c) to start work with other animal species, and (d) to look urgently for any similar effects in human populations. All of these add to the time span of the study unless and until (d) produces positive results or even suspicions. In the case of vinyl chloride, all these actions had been started by mid-1973 in a coordinated program between European and U.S. industry. Indeed, within ICI, an epidemiological study had been completed to the end of 1971 and updated to the end of 1972. This study disclosed no increase in deaths attributable to cancer among vinyl chloride workers when compared with a control group of chemical workers never exposed to vinyl chloride. The best view from all the information at that time was that there was no indication of a hazard to man. The further work was being done to make quite sure that this assessment was correct.

Finally, may I list a few facts about the role of the polyvinyl chloride industry in the whole problem of vinyl chloride and health. Before 1964, no health problem with vinyl chloride had been recognized. In that year, Solvay first observed acro-osteolysis (AOL). Their finding of a link between AOL and vinyl chloride was published in 1966 and was also communicated directly to U.S. manufacturers, and a great deal was done quickly to get this under control. In 1967 Dr. Viola (who is a senior member of Solvay's medical group) began animal experiments to

Continued on page 37

Chlorides

During the past few years, the use of chlorides in concrete has been a controversial subject. The American Concrete Institute (ACI) has been the leading authority on the subject, and its Committee 223 has been the primary source of information on the subject. The committee has been studying the problem of chloride-induced corrosion of reinforcement in concrete for many years, and its findings have been published in a series of reports. The most recent report, "Guidelines for the Control of Chloride-Induced Corrosion of Reinforcement in Concrete," was published in 1972. This report provides a comprehensive review of the problem and offers a series of recommendations for the control of chloride-induced corrosion.

One of the most important recommendations in the report is that the chloride content of concrete should be limited to a maximum of 0.06% by weight of cement. This limit is based on the assumption that the chloride content of the concrete will be determined by the chloride content of the aggregate and the chloride content of the cement. The report also recommends that the chloride content of the concrete should be determined by testing the concrete for chloride content. This can be done by using a method known as the "mercuric nitrate method," which involves the use of a mercuric nitrate solution to extract the chloride from the concrete.

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The Veniamin Gavrilovich, a Soviet scientist, has been the leading authority on the subject of chloride-induced corrosion of reinforcement in concrete. He has published a series of papers on the subject, and his findings have been widely cited. Gavrilovich has also been the author of a book on the subject, "Chloride-Induced Corrosion of Reinforcement in Concrete," which was published in 1972. This book provides a comprehensive review of the problem and offers a series of recommendations for the control of chloride-induced corrosion.

Education

A doctoral engineering program offering a practical approach to research will be offered this fall at Texas A&M University. The program will combine courses in engineering with business management and other courses designed to help engineers perform in industrial, political and social arenas, according to the school's engineering dean Fred J. Benson. The program will emphasize complex engineering problems and will include a one-year engineering internship (cooperated with industry instead of a dissertation).

Technology

The use of technology in the construction industry has been a controversial subject for many years. The American Concrete Institute (ACI) has been the leading authority on the subject, and its Committee 223 has been the primary source of information on the subject. The committee has been studying the problem of technology-induced corrosion of reinforcement in concrete for many years, and its findings have been published in a series of reports. The most recent report, "Guidelines for the Control of Technology-Induced Corrosion of Reinforcement in Concrete," was published in 1972. This report provides a comprehensive review of the problem and offers a series of recommendations for the control of technology-induced corrosion.

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fornia State University, Fresno ... Arnold J. Krubsack promoted to associate professor, department of chemistry, University of Southern Mississippi, Hattiesburg ... Donald K. Kunimitsu promoted to professor, department of chemistry, California State University, Fresno.

Ronald Neuman joins University of Minnesota, St. Paul, department of forest products, as assistant professor ... James W. Pinson promoted to professor, department of chemistry, University of Southern Mississippi, Hattiesburg ... Henry Rakoff joins chemistry faculty of the University of Southern Mississippi, Hattiesburg, as associate professor ... Stephen A. Rodemeyer promoted to professor, department of chemistry, California State University, Fresno ... Carl H. Snyder promoted to professor of chemistry, University of Miami, Coral Gables.

E. C. Taylor appointed chairman, department of chemistry, Princeton University, N.J. ... Sidney Toby becomes director, school of chemistry, Rutgers University, New Brunswick, N.J. ... William H. Wade appointed chairman, department of chemistry, University of Texas, Austin ... Glenn S. Weiland, professor of chemistry, Gettysburg College, Pa., retires after 25 years on the faculty ... Scott R. Wilson appointed assistant instructor of chemistry, Gettysburg College, Pa.

Books

New quarterly

A new journal, *Resource Recovery and Conservation*, to be published quarterly with the first issue scheduled for mid-1974, will be dedicated to detailed and comprehensive investigations of the interdisciplinary aspects of resource recovery and conservation. Editors of the journal are Dr. James G. Abert and Dr. Harvey Alter of the National Center for Resource Recovery, Washington, D.C. The yearly subscription price (one volume, four issues) is \$34.50 from Elsevier Scientific Publishing Co., P.O. Box 211, Amsterdam, the Netherlands.

Functional Monomers: Their Preparation, Polymerization, and Application. Vol. 1. Ronald H. Yocum, Edwin B. Nyquist, editors. xii + 715 pages. Marcel Dekker, Inc., 305 East 45th St., New York, N.Y. 10017. 1973. \$43.50. A practical reference work.

New Developments in Gas Chromatography. Howard Purnell, editor. viii + 408 pages. John Wiley & Sons, Inc., 605 Third Ave., New York, N.Y. 10016. 1973. \$9.95.

Organicum: Practical Handbook of Organic Chemistry. Heinz Becker, et al. xi + 747 pages. Addison-Wesley Publishing Co., Inc., Reading, Mass. 01867. 1974. \$23.50.

Polymers: Chemistry and Physics of Modern Materials. J. M. G. Cowie. xii + 298 pages. Intext Educational Publishers, 257 Park Ave. South, New York, N.Y. 10010. 1974. \$11.75.

Principles of Quantum Mechanics. W. V. Houston, G. C. Phillips. xi + 376 pages. American Elsevier Publishing Co., Inc., 52 Vanderbilt Ave., New York, N.Y. 10017. 1974. \$39.50.

Continued from page 21

get a better understanding of AOL. He reported preliminary findings in Tokyo in 1969 and his earliest observations of a carcinogenic effect were delivered to the 10th International Cancer Congress in Houston in 1970. It must be assumed that his paper reached a large and influential audience. Nevertheless, the only action came first from European industry, through the Maltoni animal studies, in 1971, and then from U.S. industry with its Biotest (Laboratories) program in mid-1973. ICI initiated epidemiological studies in 1971. The results of these were given to MCA in late 1972 with the recommendation that similar work should be done by MCA. It was this latter work that finally led to the discovery of a human cancer hazard.

The point is obvious. For the past 10 years the industry on both sides of the Atlantic has been active in its work to protect health, and, in Europe, animal studies have been in continuous progress for the past six and a half years. The latest and most serious hazard of angiosarcoma of the liver has only been discovered through the coordinated and unprompted effort of European and U.S. industry.

This is the record of an industry that has taken action and published, and not, as you have "hinted" in other columns, of an industry that "withholds information."

Barnes
A. W. Barnes
Director, Imperial Chemical Industries
plastics division

Here is NIOSH's response:

Dear Sir:
It is still difficult for me to understand how a description of the preliminary findings of a rat study conducted by an unnamed Italian investigator can be retrospectively interpreted as providing to NIOSH full information on the significance of Prof. Maltoni's findings in July 1973.

We still disagree on the details related to us. Our notes do not confirm a description of tumors other than Zymbal gland tumors or their metastases, nor do they confirm specific mention of 250 p.p.m. of vinyl chloride as being tumorigenic. It is reassuring, however, that the ICI letter corroborates our notes that there was no discussion of angiosarcoma of the liver at the July 1973 meeting.

In spite of the differences, I respect the ICI medical officer who attended the meeting and appreciate very much his coming to this country and briefing us. Incidentally, I did not mean to use the word "critically" in the pejorative sense, but rather in the sense of exercising careful judgment or judicious evaluation.

Marcus M. Key, M.D.
Assistant Surgeon General, Director,
National Institute of Occupational
Safety and Health

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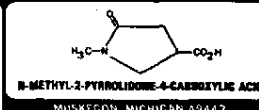
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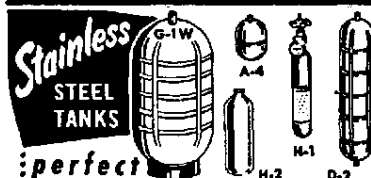
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RETIRED ACS members are allowed three nondisplay ads in a calendar year if the conditions already stated are followed. Situations-wanted ads for part-time, freelance, or consulting work are excluded from this service to unemployed members. However, retired members

may advertise for full- or part-time positions or consulting work. Additional insertions after the free ones may be made at 25 cents per word.

Nondisplay insertions by EMPLOYED ACS members seeking full- or part-time positions or consulting work and all nondisplay insertions by Student Affiliates of the Society will be accepted at 25 cents per word for each insertion, no minimum charge. Requests for placement of situation-wanted ads must state ACS membership status, or whether the advertiser is retired (and 55 years of age or older) to ensure publication of the ad in the proper classification. Nonmembers are charged \$1.25 per word, minimum charge \$18.75. Ads submitted by employed members, student affiliates, and all nonmembers should be sent to Chemical and Engineering News, 50 West State St., Westport, Ct. 06880.

In printing these ads, ACS assumes no obligation as to qualifications of prospective employees or responsibilities of employers, nor shall ACS obtain information concerning positions advertised nor of those seeking employment. Replies to announcements should carry copies of supporting documents, not original documents. Every reasonable effort will be made to prevent forward-

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ACS expects each user of this section to consider himself morally obligated to acknowledge all replies to his advertisement.

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Display advertisements \$118 per column inch (space unlimited). Lower rates on contract basis. Minimum display space, one inch, with inch units thereafter. Agency commission and cash discount allowed on display ads only. Standard setting \$1.25 a word, minimum charge \$18.75 each. Include five words for box address. Advertisements from outside the U.S. should be accompanied by information stating the New York bank which will issue a bank draft in U.S. funds. The advertisement will be run on the nearest publication date following receipt of the bank draft.

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IMPORTANT NOTICE

Various state laws against discrimination and the Federal Civil Rights Act of 1964 prohibit discrimination in employment because of race, color, religion, national origin, age, and sex (unless based on a bona fide occupational qualification). Help wanted and situations wanted advertisements on these pages are for readers' convenience and are not to be construed as instruments leading to unlawful discrimination.

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The following statement is printed at the request of the Council Committees on Membership Affairs and on Professional Relations, with the approval of the Council.

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Write the Employment Aids Office at the address below to request Clearing House registration forms, to submit, renew, or change a Situations Wanted Advertisement, or to request a search of newspaper "positions open" advertisements. Unemployed

members who need initial counseling and advice on employment matters may telephone collect (202) 872-4528. **EMPLOYERS:** Any employer needing chemists and chemical engineers may request a search of the file of candidates by telephone (202) 872-4528 or by writing to the address below. After specification of position requirements, a search of the complete file of candidate records

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Vinyl Plants Found Clear Of Pollution

By Morton Mintz

Washington Post Staff Writer

Preliminary monitoring around industrial plants that produce toxic vinyl chloride gas, or that convert the gas to common plastic, found no scientific evidence of emissions in the atmosphere which pose "an imminent hazard" to people living in the vicinity, the Environmental Protection Agency said yesterday.

"However, prudence dictates that reasonable steps should be promptly taken to reduce vinyl chloride emissions to the lowest practical level," EPA Administrator Russell E. Train said.

He met with senior executives of the 28 companies that manufacture the gas and the plastic, polyvinyl chloride, to urge a step-up in efforts to minimize discharge of the gas into the environment. He said afterward that they had assured their cooperation.

Train called the meeting after reviewing a summary of his preliminary monitoring results in the neighborhoods of 2 plants grouped in seven chemical complexes.

More than 95 per cent of the samples collected within a radius of a half-mile of the plants' property lines contained vinyl chloride at a level of less than 1 part per million, the agency reported. In one case, 3.4 ppm was recorded three miles away although several readings averaged only .5 ppm.

At four of the complexes— at Louisville, Ky., Long Beach, Calif., Painesville, Ohio, and Lakeview, La.—a number of samples showed more than 1 ppm. At the B.F. Goodrich plant at Louisville, where the average ranged between .05 and 1 ppm, an apparent one-time high of 33 ppm was recorded. The other sites monitored were at Delaware City, Del., Flemington, N.J., and Leominster, Mass.

Because vinyl chloride has been strongly implicated as the cause of a rare but fatal form of cancer, angiosarcoma of the liver, the Occupational Health and Safety Administration has set an emergency standard for workplaces of 50 ppm, but has proposed to lower the standard for job-sites to whatever level at which the gas can be detected.



RUSSELL TRAIN
... called meeting

Worldwide, 19 cases of angiosarcoma of the liver have been confirmed at facilities producing polyvinyl chloride for phonograph records, floor tiles, electrical insulation and many other uses.

In each case, the victim had been repeatedly exposed over many years to high concentrations of the gas. The possibility that the gas figured in the death from liver cancer of several non-workers is being investigated.

Train, at his meeting with the executives, emphasized the preliminary nature of the findings, saying that only a limited number of samples was taken at each facility, and that meteorological and temperature conditions during the monitoring varied.

He said that the levels of vinyl chloride in the air fluctuate sharply with such events as the periodic opening of reactor kettles, accidental plant discharges and changes in production processes.

EPA monitoring teams checked water discharges and sludge from the plants in the survey, but found no basis at this time for considering that the vinyl chloride levels "if handled properly are hazardous to human health or aquatic life," Train said.

Train has cited the difficulties incurred in getting hard data on vinyl chloride as an urgent argument for giving the EPA enlarged powers as proposed under toxic substances legislation, which has been languishing in a House-Senate conference committee.

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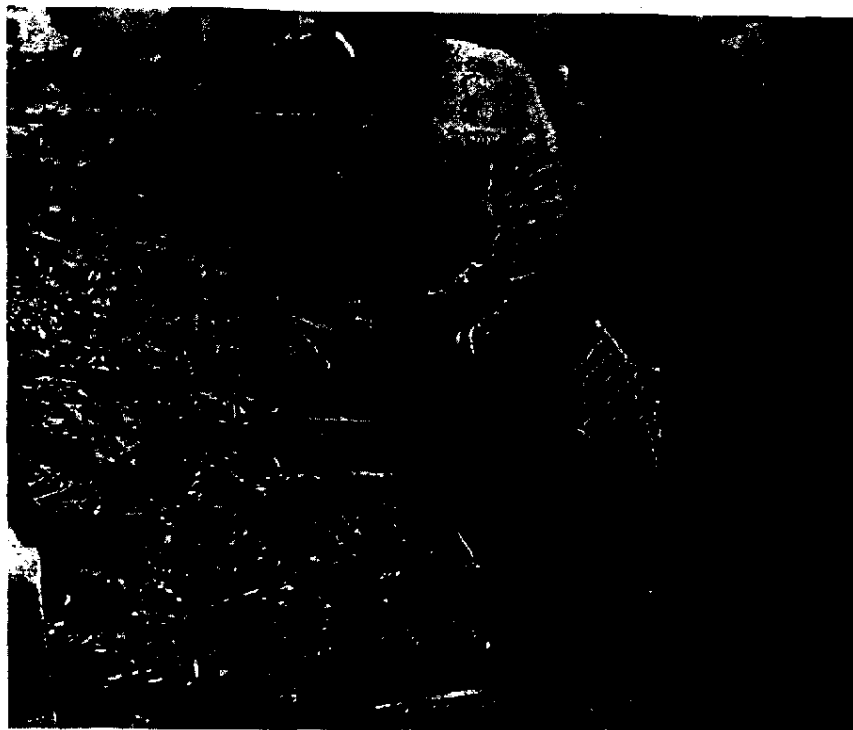
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PACKAGING OF FOOD and other products is a major market for polyvinyl chloride.

Second thoughts on using PVC

Packagers stick with PVC, but seek substitute materials for new products and as hedge against possible forced cutbacks

Continued discovery of liver cancer cases among workers in polyvinyl chloride plants is posing a threat to the material's future in the packaging field. Several food manufacturers are dropping plans for packaging new products in the controversial plastic and PVC users are searching for possible substitutes in case federal regulations covering worker exposure force cutbacks in output.

At 325-million-lbs./year consumption, packaging is a major outlet for the 4.6 billion lbs./year of PVC resin produced. And the reluctance of food packagers to use PVC could signal the beginning of harder times ahead for the material.

Reports earlier this month of two cases of angiosarcoma in Czechoslovakian PVC plants has raised the toll to 24. And as those numbers mount, public pressure is building on the Occupational Safety and Health Administration to promulgate its "no detectable level" exposure limit for vinyl chloride monomer in work environments. With the final standard due Oct. 5, OSHA is said to be seeking a compromise position that will avoid lawsuits from industry on the one side and labor and consumer groups on the other. One source tells *Chemical Week* that "trial balloons of 20-25 ppm. have been lofted by the agency."

Industry representatives have been

contending that imposition of a no detectable level limit—essentially 1 ppm.—for worker exposure is technically impossible. Enforcement of such a standard, they claim, would cause shutdown of all PVC plants in the U.S., eliminate 1.7-2.2 million jobs in consuming and related industries and result in a loss of domestic production value of \$65-90 billion/year.

Manufacturers of substitute materials are not crowing over PVC's setbacks. Most, suffering feedstock shortages, are struggling to satisfy their own markets. Moreover, for many applications, there is no substitute for PVC.

And the vinyl industry's occupational health problems may be precursors of difficulties for other segments of the organic chemical industry. "It's only one tree in the forest," says Cesare Maltoni, of the Institute of Oncology (Bologna, Italy), whose research first predicted the link between VCM exposure and cancer (*CW*, July 17, p. 30).

The National Institute of Occupational Safety and Health has taken on the task of developing work exposure standards for some 400 chemicals by 1976. By November the agency hopes to publish exposure standards it has developed for five ketones—2-butanone; cyclohexanone; 2-pentanone; hexone; and acetone. It had hoped to have 40 chemicals completed,

but "underestimated the difficulty."

NIOSH also will be getting approximately 18 standards per month from three consulting groups: Stanford Research Institute, Kaiser Foundation and Arthur D. Little.

Future Unclear: Opposing what he called "blackmail" over the alleged conflict between job losses and worker safety, Peter Bommarito, president of the United Rubber Workers and chairman of AFL-CIO's health and safety committee, says "this country survived for nearly 200 years without PVC and we can survive in the future without it."

But Arthur D. Little (Cambridge, Mass.), in its examination of the possible demise of the PVC industry for the Society of the Plastics Industry says: "It would not be possible to duplicate the exact properties of vinyl plastic products by using substitute raw materials." And even if it were possible to find a product with the exact or equivalent properties, says ADL, cost of production would probably price the substitute out of the market.

"Choice of a packaging material is a series of complex considerations," says an industry observer. For many applications it's difficult, if not impossible, to find a material that fits the bill exactly. PVC has clarity and excellent oxygen and carbon dioxide barrier qualities. Polypropylene does not. On the other hand, polypropylene is a tough construction material.

According to *Modern Plastics'* 1973 survey on plastics production, some 79 million lbs. of PVC were used for bottles, compared with only 19.8 million lbs. of polypropylene for the same purpose. And while polypropylene is more available than PVC, a Phillips Petroleum spokesman says, "We don't have that much."

Search for Substitutes: There was an earlier spur to the search for PVC substitutes when a problem arose with the test marketing of half-gallon PVC bottles for liquor in 1973. Alarmed by reports of VCM migration into the liquor, the Food and Drug Administration proposed to drop to zero the allowable VCM migration into food, drugs and cosmetics on May 9, 1973. Almost immediately, the Bureau of Alcohol, Tobacco and Firearms cancelled its approval for the test marketing of the half-gallon PVC liquor bottles. (Final FDA decision on VCM migration limits is still pending.)

According to one packaging supplier, "We lost some business in PVC over the liquor decision, and it was picked up by our glass operation."

Glass is probably the best qualified al-

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The eff can due to formaldehyde, but it was measured in Santa Barbara 8/21/74. Mon had 44ppm! experience, then left. Goodrich. No other exposure, did after 15 years of anger. 44ppm exposure is bad news!

ternative across the board, but it, too, is in tight supply.

For certain film applications, polyvinylidene chloride could benefit. For example, Dow notes that for odd shapes and barrier packs, such as for cheeses, it is "ideal." But a spokesman notes, it is more difficult to handle than PVC in machines, and it is more costly.

Other packagers report little if any increase in interest from marketers anxious to switch. But most agree that the PVC problem is influencing new-product introduction. Case in point: Borden's ReaLemon Subsidiary, which was test marketing a line of cocktail mixes called On the Rocks in PVC containers. The PVC packaging idea has been dropped. "We're exploring a number of alternatives," a spokesman reports.

Opinion seems unanimous that large market shifts from PVC would be impossible to soak up. Construction is the largest consumer of PVC resins. Last year, for example, 1.34 billion lbs. of PVC were used to make pipe and fittings. That's more than 25% of total PVC consumption, estimated by the SPI to be 4.6 billion lbs. in 1973. An additional 464 million lbs. went into flooring. And siding use as well as miscellaneous construction applications pushed total construction markets for PVC well over 2 billion lbs. in 1973. Auto upholstery, seat covers, mats and decorative tops accounted for 256 million lbs.

PVC output has risen about 70% during the past five years, for a compound growth rate of about 11%/year from 1968 to 1973. This year's growth, however, is likely to be much slower. Output during the first five months of 1974 was up only 1.7%, according to data compiled by the Tariff Commission. That's partly an indication of slackening growth in demand but also reflects shortages of capacity.

Reactor Role: Of the 24 reported cases of angiosarcoma linked to VCM exposure, only one, in Sweden, involved a worker at a monomer plant. Of the rest, 20 were in PVC plants, two among compounders and fabricators (one wire extrusion plant, one plastic fabric plant) and one West German worker engaged in filling aerosol pesticide containers with a VCM propellant.

Because vinyl chloride plants are generally automated they can be built without enclosures. But PVC production is labor-intensive, and in the colder climates it's necessary to enclose the plants. "Less than half are open," estimated one company spokesman. Goodrich has announced that it plans to build an "out-

door" PVC plant alongside its Louisville plant, where the VCM-angiosarcoma link was first reported last January.

Four basic polymerization processes are used for PVC production—suspension (which accounts for more than 75% of the tonnage), emulsion, solution and bulk. The reactor or autoclave, where polymerization takes place, is the key piece of equipment in each. Conversion of 85% of the monomer is considered high. Unreacted monomer is removed from the unit by vacuum for recycle to the process before the polymer is fed into a drying tower or storage tank.

Moreover, some polymer sticks to the reactor sides, hardens and accumulates, lowering the heat transfer in the units. When the heat transfer becomes too low, or a different resin is produced, it becomes necessary to clean the reactors.

High-pressure water jets are used primarily to do the bulk of the cleaning. But in some older plants, the ports in small kettles are positioned so that water jets can't be used. Some efforts are under way

It will be impossible to duplicate exact properties of vinyl

to develop new monomer-absorption, hardened resin removal methods. For example, GAF has patented a solvent addition method.

One producer's engineer, who has worked around PVC plants and been exposed to the monomer for over 20 years, thinks companies will have to "sharpen up polymerization techniques and methods of stripping free monomer."

He would like to see free-monomer concentrations in the dryer reduced to 500 ppm., claiming they are now up to 3,000-4,000 ppm. on resin leaving the plant. "The plant of the future—if we have one—will be able to strip most of the free monomer," he says.

Meeting Standards: Acknowledging that the 1-ppm. standards are "going to be tough to achieve," Daniel Boyd, director of OSHA's standards development office, says a combination of engineering controls, work practice methods and respirators could be used.

A spokesman for one manufacturer says he fears "we'll be hung with hose-fed positive pressure masks." All sources agree that self-contained supply packs, similar to those used by astronauts, couldn't be used because the workers couldn't function. In fact, labor sources

oppose use of respirators, too. "Have you ever tried working all day with a respirator on?" asks Tony Mazzochi of the Oil, Chemical and Atomic Workers union.

One possible answer is to collect the escaping monomer and vent it to the atmosphere. But the Environmental Protection Agency, concerned about escaping monomer, has been monitoring the air around 10 PVC plants. "When OSHA gets through EPA will move in and won't want monomer going out the stack," says a Union Carbide spokesman. EPA contends that there are 6% VCM losses from PVC plants and concentrations of 1-2 ppm. in air outside plants.

Another possibility: absorbing the monomer in the vent gases on activated carbon. Calgon has reported successful laboratory studies of the technique and is installing a system for the effluent from the vent condensers at a southwest PVC plant. The company says the monomer can be regenerated with steam.

But other companies are skeptical, saying relatively concentrated streams of inert gases with relatively small amounts of oxygen are needed for activated carbon absorption. One company reports its estimated cost for activated carbon scrubbing in its resin-drying operation at \$500,000 per stack.

Chemical Carcinogens: Maltoni is already looking for other chemical carcinogens, based on evidence supporting his predictive cancer techniques. He is suspicious of all carbon-chloride groups. Maltoni is also doing more work on VCM, studying inhalation doses of 25 ppm. down to 1 ppm. and doing tests on the effect of ingestion.

"I'm sure 25 ppm. will show cancer, too," says Joseph Wagoner, chairman of NIOSH's occupational carcinogen committee.

"There's no way to demonstrate the safe level of a carcinogen," he warns. Wagoner is also concerned that other diseases may be caused by worker exposure to VCM. While critical of the "serious limitations" of the Tabershaw-Cooper epidemiological studies sponsored by the Manufacturing Chemists Assn., he notes that they demonstrated brain and lung damage linked to VCM exposure.

Occupational health standards may be one of the greatest problems the chemical industry has faced. But great optimism and faith in the industry has been expressed in some unexpected quarters. "The ingenuity of American industry never fails to surprise me," says NIOSH's Wagoner. "Somehow, surprising things can be done."

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For Immediate Release

Richard F. Blewitt
(202) 483-6126, ext. 282

WHITE SULPHUR SPRINGS, West Va., June 6 -- The Manufacturing Chemists Association (MCA) today announced that it will administer four new research projects to further probe the relationship of carcinogenicity in animals due to vinyl chloride as it may relate to humans. The studies will be funded by U. S. producers involved in the synthesis and polymerization of the chemical. This is in addition to substantial research being carried out by individual companies here and abroad.

The new projects were approved unanimously by the Association's Board of Directors in session during MCA's Annual Meeting here.

The program includes:

1. A study of animal metabolism;
2. A study of teratogenesis (animal fetus);
3. Animal chronic inhalation studies at concentrations below 50 ppm, in an effort to identify a "no-effects" level, and
4. An acute inhalation experiment in which animals will be subjected to a massive exposure simulating conditions which might be experienced by a community exposed to a tank car rupture in a transportation accident. The animals would be observed over their lifespan.

(more)

The funding companies, which are supporting current research, and MCA consider it essential that the program be expanded to determine the conditions necessary to assure the safety of workers involved in the manufacture and use of the products and of the plant neighborhoods in which they are made.

The scientific information developed from this program will be disclosed publicly without restriction. Further, as appropriate to the advancement of the program, technical reports will be developed and made publicly available on work practices, industrial hygiene monitoring and analysis and the medical surveillance of exposed workers.

The first two projects will be conducted by The Dow Chemical Company. The other projects will be carried out by Industrial BIO-TEST Laboratories, Inc. Industrial BIO-TEST has been conducting vinyl chloride animal exposure studies, under contract to MCA for administration, since Feb. 1, 1973. Progressive results have been announced in this continuing study.

Results of another study, documenting the health experience of present and former employees who have worked with the chemical, were released May 7 of this year. Tabershaw-Cooper Associates, Inc., conducted this epidemiological study.

All findings also have been reported immediately to government bodies concerned with the problem. This practice will be followed in respect to the new studies.

(more)

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It is estimated that the four projects will cost a minimum of \$400,000 to \$500,000. Because of the fluid status of scientific knowledge and regulatory climate in respect to vinyl chloride, an upward revision of the cost estimate might be necessary to accomodate change of test protocols.

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