

TETRAETHYL LEAD FATAL TO MAKERS

An Industrial Peril Which the Washington Inquiry Into Gasoline Does Not Cover.

8 DEAD, 300 ILL, IN 1 PLANT

Dangers in Producing the Chemical Compound Shown in Record at Deep Water, N. J.

DEATHS SINCE PLANT CLOSED

Illness Begins With Hallucinations of Butterflies and Terminates in Violent Insanity and Death.

Deaths in Tetraethyl Gas Production at a Single Plant

- Sept. 21, 1925—FRANK W. DURR, 37 years old, dye worker; died at Penns Grove, N. J.; attended by Dr. Raymond B. Jarratt.
- July 30, 1924—JOSEPH CIANCI, 24 years old, dye works operator; died at Salem (N. J.) Memorial Hospital; attended by Dr. Harry W. Lee.
- Aug. 12, 1924—FRANK HANLEY, 23 years old, dye worker; received at Salem Hospital with gastric ulcer and underwent operation, but went insane subsequently from tetraethyl lead poisoning; attended by Dr. F. H. Church.
- Oct. 20, 1924—SIM JONES, 47 years old, negro janitor at plant; died in Salem Hospital; attended by Dr. Lee.
- Feb. 13, 1925—FREDERICK W. DEFIEBRE, 21 years old, dye worker; died at Salem Hospital; attended by Dr. Lee.
- Feb. 16, 1925—ROBERT F. HUNTSINGER, 35 years old, dye worker; died at Cumberland County Hospital for the Insane at Bridgeton, N. J.; attended by Dr. E. C. Lyon.
- Feb. 28, 1925—LORING M. BOODY, 53 years old, carpenter; died at Carney's Point, N. J.; attended by Dr. Lee.
- March 27, 1925—JAMES CONNELL, 49 years old, millwright; died at home in Wilmington, Del.; attended by Dr. James A. Draper.

By SILAS BENT.

Eight workers in the du Pont tetraethyl gas plant at Deep Water, near Penns Grove, N. J., have died in delirium from tetraethyl lead poisoning in eighteen months and 300 others have been stricken, but not fatally. Whatever the findings of Surgeon General Hugh S. Cumming's committee on the distribution and use of "antiknock" gasoline treated with the compound, the full record of fatalities, now made public for the first time, reveals afresh the hazards of its industrial production. The plant has been closed since April.

Four of the deaths at Deep Water have occurred this year, three in a single month, while the State and Federal authorities were still investigating the disaster of last October in the Standard Oil's Bayway plant near Elizabeth, N. J., in which five lost their lives. The poisonings this year of du Pont employes occurred in a new million-dollar plant, after two years of experience in production and presumably after the experimental stage had passed. The Federal committee of seven appointed by Dr. Cumming, however, is not concerned with this industrial phase. It is directed to report on the commercial phase by Jan. 1, "if possible."

The first cases of tetraethyl lead intoxication known to medical science developed in September, 1923, at the du Pont plant, and baffled famous neurologists who were consulted. One of the early symptoms is a hallucination of winged insects. The victim pauses, perhaps while at work or in a rational conversation, gazes intently at space, and snatches at something not there. The employes at Deep Water have ironically dubbed the plant "The House of the Butterflies."

The list of dead presented herewith was officially verified at the du Pont headquarters in Wilmington, Del., on Friday. Dr. A. K. Smith, chief of the medical staff, says that the 300 cases mentioned do not include those slightly affected. Some were merely hysterical from anxiety. About 80 per cent. of all who worked in "The House of the Butterflies," or who went into it to make repairs, were poisoned, some repeatedly.

One Other Death in Doubt.

The du Pont officials said that the list of eight which I presented was complete, and that there had been no other deaths

from tetraethyl at Deep Water. No report had been made to them, it was said, regarding John Demesse, a plumber, who died last Sept. 11 at Delaware Hospital in Wilmington after doing some work in the plant. The death certificate gives typhoid as the cause.

Mrs. Mary Casey of 606 Spruce Street, Wilmington, a cousin of Demesse and his closest relative in this country, told me of a conversation with Dr. Lawrence J. Rigney, whom she called into the case.

"He said there were typhoid germs in the body," she explained, "but that John's lead poisoning didn't help him any."

Efforts to reach Dr. Rigney were unsuccessful. Not he, but Dr. John R. Ruaso, a member of the hospital staff, signed the death certificate. When asked about the symptoms of the Demesse case he said he had no recollection of it, and he reported several hours later that he could find no record of it at the hospital. The death certificate gave no contributory cause of death, nor was there any answer in the certificate to the question: "Where was disease contracted if not at place of death?" This space was left blank.

Demesse was a widower, 35 years old. At du Pont headquarters the point was stressed that if poisoning had contributed to his death his relatives would have demanded a settlement.

Death After Three Attacks.

The first tetraethyl poisoning of medical record was that of Harry A. Zanes, now 53 years old, who lives at 97 I Street, in Carney's Point, an industrial town owned by the du Ponts adjoining Deep Water. He became ill on Sept. 9, 1923, and went to the emergency hospital maintained by the du Ponts on their reservation of six square miles across the Delaware River from Wilmington, where the chemical and smokeless powder plants are grouped. After treatment he went back to work, but a week later had to go home. He couldn't eat, and on the rare occasions when he slept he suffered from frightful nightmares. On Sept. 19 he became violent and two trained nurses were assigned to care for him.

"The patient has twitching muscular contractions," the nurses recorded; "respiration rapid, pulse shallow." And a little later: "Patient's head is thrown back rigidly; thinks some one is after him to kill him." And then: "Patient's pupils dilated; grinning and gritting teeth." A little later he was put into a straitjacket, after he became so violent he could not be held in bed.

Zanes was ill three months and was under the care of Dr. A. R. Lynch, then a member and afterward chief surgeon of the medical staff on the reservation. When Zanes was able to work again he was assigned for a time to another plant, but returned to tetraethyl production and was poisoned again. In September of last year it happened a third time. These were much slighter attacks, although the man became delirious.

"The last time he didn't know it was lead he was working with," said Mrs. Zanes, "and Dr. Lynch raised a stink about it at the plant."

The testimony of nearly all the persons I saw, however, was that the du Ponts exercised every precaution possible to safeguard their employes from the deadly stuff they were handling.

First Fatality an Old Employee.

Frank W. (Happy) Durr, 37 years old, who had worked for the du Ponts since he was a lad of 12, was the first employe to succumb. He was ill only a short while and died in a straitjacket on Sept. 21, 1923, at his home in Penns Grove. There was no story about it in his home paper, and none elsewhere, although the Penns Grove Record displayed in a half-column account on the first page the facts about Otto J. (Snapper) Barkdull, who was accidentally killed by electricity in the plant two days after Durr's death.

Thomas C. Summerill, editor of The Record, said he did not remember the circumstances. "I don't think I did not print anything about Durr's death because we couldn't get it," he explained. "They suppress things about the lead plant at Deep Water. Whatever we print we pick up from the workers."

Durr's widow, who lives now with her mother at Woodstown, ten miles east of Penns Grove, told me that Barkdull had worked at the plant only two months, whereas Durr had been employed by the du Ponts for twenty-five years.

At that time the du Ponts were producing tetraethyl lead in what had been a dye works. In the same building was a death from poisoning, another in August, another in October. Work was already under way on a five-story brick structure, 8x150 feet in size, to be devoted to this purpose, and it was to be opened Jan. 1 of this year.

Special Care for the Afflicted.

All the men who died and who were on the tetraethyl force were classified in the death certificates as "dye workers" or "dye operators." The reservation known as "the dye works" is, in fact, aside from the powder mills (where 25,000 men were employed at the peak during the war in the production of smokeless powder), a congeries of poison plants. Phosgene and chlorine gases, as well as the toxic benzol series, are manufactured there.

In the old tetraethyl plant there was a series of explosions and fires, which occurred from chemical reactions while the autoclaves, huge mixing vats, were being emptied or cleaned. From these there were deaths, but there were many injuries. C. D. Porch, superintendent of the plant, was himself badly burned, and some of the chemists required medical treatment. Arrangements were made with the Salem (N. J.) Memorial Hospital, to which the du Ponts give annual contributions, to care for patients from Deep Water, and such cases have been its chief source of revenue. An executive of "the dye works" is on the hospital's Board of Managers.

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Thought Danger Averted.

Jones died on Oct. 20, about the time the series of deaths in the Standard Oil plant at Bayway centred public attention on the startling consequences of tetraethyl poisoning. An official of the Ethyl Gasoline Corporation said publicly that the du Ponts had been having trouble, too; and Irénée du Pont, President of the E. I. du Pont de Nemours Company, issued on Oct. 30, ten days after Sim Jones died, the following statement:

"Tetraethyl lead, which the du Pont Company is manufacturing on a commercial scale, and which is reported as the cause of the recent unfortunate accident at the Bayway plant of the Standard Oil Company, should not be confused with ethyl gas, an improved motor fuel which contains less than one-tenth part of 1 per cent. of tetraethyl lead."

"Tetraethyl lead is poisonous, and its manufacture involves risk, but no more so than many chemicals manufactured and used in enormously greater amounts. The du Pont Company, during the experimental period, experienced much trouble with men poisoned, even to the extent of fatalities. During the past year of production, when more than 100 men have been employed continuously, the difficulty has

diminished steadily. In the past several months, under full production, only slight difficulties have been encountered. Experience has taught the necessary protection, both in plant and medical care.

We find that workmen cumulatively poisoned by this material invariably indicate it in the incipient stages, before any harm is done, by a marked symptom. Doctors of the employ of the company continually make tests on workers engaged in this process.

Later Precautions Futile.

In "the past several months" to which Mr. du Pont referred as causing "slight difficulties," there had been three deaths. There were no more fatalities until the following February, after work had begun in the new plant, where special precautions had been taken. In that month three workers died.

A change was made in the process of manufacture. Prior to this the ethyl for the compound had been introduced in the form of ethyl bromide; but the bromine required for this ingredient is costly to manufacture and difficult to procure in quantities sufficient for such commercial operations as the du Ponts had in view. The chemists decided to try ethyl chloride instead. Chlorine, a greenish-yellow and extremely poisonous gas, can be manufactured in huge quantities.

Frederick W. DeFiebre, a worker, 21 years old, was the first to die, on Feb. 21, from poisoning in the new plant. To the Salem Hospital is an ambulance run of but twenty minutes, and Dr. Harry W. Lee, chief surgeon of the du Pont staff at Deep Water, rushed the patient thither for treatment.

Even before this death Robert F. Huntsinger, 35 years old, had become ill and had insisted on going to his home and living away in

When he became violently insane Dr. E. C. Lyon, who was treating him and who is the county physician, took him to the Bridgeton Hospital, where it was found that the patient's condition was such he could not be cared for. Then he was taken to the Cumberland County Hospital for the Insane, where six men were required at times to restrain him. He died there Feb. 16, two days later. Dr. Lee went from Deep Water to help Dr. Lyon attend the patient.

A reporter for a Bridgeton newspaper asked the county physician whether he would ask for an inquest. "No," said Dr. Lyon, "it was not an accident. It was an occupational disease, and there is no occasion to call in the coroner."

Plant Closed Soon Afterward.

Dr. Lyon, who repeated this statement to me, was warm in his praise of the du Ponts for the care they exercised in behalf of their employes. The facts about the death were printed in the Bridgeton newspapers, and inquiries were made regarding it at du Pont headquarters. A statement was issued by the publicity department in which, after giving the facts of his illness, it was said:

"Meanwhile the company, because of his illness and the illness of Fred W. Fiebre [DeFiebre], a laborer who later died, has shut down the plant to make modifications to insure greater manufacturing safety. The du Pont Company experienced trouble with men becoming poisoned in the early stages of the manufacture of this chemical, but for a year difficulties have diminished steadily and for the past several months, under full production, only slight trouble had been encountered until these recent fatal illnesses occurred."

The plant had, as a fact, been closed by order of Dr. Andrew F. McBride of Paterson, chief of the New Jersey State Labor Commission. Dr. McBride had been conducting a State-wide inquiry into the manufacture, use and transportation of tetraethyl lead. In the latter part of November he reported to Governor Silzer that no more of the poison should be manufactured.

The plant was closed five weeks before Dr. McBride gave permission to reopen it. Meanwhile the du Ponts spent \$60,000 making mechanical adjustments and installing a new ventilating system, whereby warmed and moistened air within the plant is changed every forty seconds, in order to reduce the danger.

Two Deaths After Plant Closed.

The last fatalities were of a millwright and his helper, who were poisoned while making some repairs and died after the plant was closed. These were James Connell, who died at his home in Wilmington, and Loring M. Boody, who died at Carney's Point, on the du Pont reservation.

Boody, the helper, was attended by Dr. Lee of the du Pont staff, and the death was attributed in part to uremic poisoning. The day before Boody's death Connell went home ill, and died on March 27. In regard to both these cases the du Pont Publicity Bureau gave out items to the Wilmington daily newspapers, which are owned by the du Ponts.

Regarding the four deaths which have occurred this year, therefore, there has been scattering publicity. The fact of Huntsinger's death at Bridgeton was reported in the New York newspapers. But even before these deaths occurred there were persistent rumors of trouble at Deep Water; and last November it was reported and printed that there had been nine deaths, although at that time there had been but four.

C. K. Weston, who is at the head of the du Pont Publicity Bureau, said that the earlier deaths were not treated as news because, until after the Bayway tragedy, there was no public interest in such occurrences.

Dangers Soon Revealed.

"The complete list of deaths from the Deep Water plant is now in the hands of Dr. McBride," he added. "We have told the facts and it is absurd to say that the du Ponts have suppressed anything, or that they subsidize hospitals. As a matter of custom they contribute small sums to all the hospitals which are near their plants and which are likely to be asked to treat patients. The contribution this year to the Salem Hospital was only \$500; but, of course, in addition to that the company pays, and pays well, for the treatment of its patients."

"Our people themselves did not know about this disease at first, but the physicians quickly learned to cope with it. We began manufacturing tetraethyl lead about three years ago, and one of the doctors said to me once that he had never known an industrial malady which flew the red flag so quickly."

"The du Ponts are well known for their interest in their employes. They spare no expense to protect the health and lives of their men, and when one is hurt or loses his life, the company pays, in New Jersey and every other State where it has properties, higher compensation and pensions rates than the law requires. It is a fact that we have a great deal of trouble inducing the men to be cautious. We have to protect them against themselves."

Mr. Weston had heard of the workers' name for the plant.

"Some of them drew pictures of butterflies on the walls of the plant," he said. "This disease is somewhat like delirium tremens. Instead of seeing snakes, the men see butterflies."

Danger in Gas, Not Gasoline.

Since production began 300,000,000 gallons of ethyl gasoline have been distributed in twenty-eight States, from 12,000 filling stations, with no record of poisoning or ill-health from its use, according to Mr. Weston. The name "looney gas" is deceptive, in his view, in that it may apply to the ethyl gasoline instead of the fumes from tetraethyl lead.

Dr. Lynch, former chief surgeon at Deep Water, is now practicing medicine at Wilmington and occasionally has tetraethyl cases. He was reluctant to discuss the disease because he is no longer associated with the du Ponts, and said he had refrained from publishing a paper dealing with his year's experience in their service for the same reason.

"In several hundred cases which I

treated during that first year," he said, "I did not lose one. Durr, who died while I was there, was under the care of his family physician. I had the first cases of the disease ever known. Although it is nervous and mental, neurologists had no clinical background for it. It was a brand new challenge to medical skill."

"We found that nightmares were the first symptom and that these were followed by insomnia. Then came restlessness and inability to eat. Sometimes a patient lost as much as thirty pounds in a few weeks. The blood pressure fell. Frequently they were nauseated. Then came hallucinations. There was no 'wrist drop,' none of the symptoms of the well-known industrial lead poisoning. In the later stages some of the men became suicidal and had to be prevented from destroying themselves."

Charles Hendricks, employed as painter in the tetraethyl plant, was one worker who tried to kill himself. He jumped from a ferry between Penns Grove and Wilmington last April. He was delirious, and his weight had gone down from 180 pounds to 135. Harry Baker, who was confined at the Salem Hospital, jumped from a window while his male nurse was out of the room, but was caught and returned to his bed. This incident came to public attention and the patient was removed to a private sanitarium at Gladwyn, Pa., where the du Ponts are paying his bills in addition to a bi-weekly allowance to his wife. He is still under treatment.

Precautions in Distribution.

At first tetraethyl lead was shipped from Deep Water in small containers, which were stuck into funnel-like attachments at filling stations, so that the poison would mix automatically with the gasoline as it was pumped into motor tanks. This was soon seen to be dangerous and the plan was changed. The mixture was shipped in 40-gallon metal drums to distributing points, there to be mixed with the gasoline. Then, at its last stage, it was found safest to mix the tetraethyl with gasoline at the point of manufacture and ship it in tank cars. In this way it was expected to keep it away from persons not educated to the proper precautions in handling the stuff, such as washing in coal oil, or kerosene, parts of the body exposed to it. The industry had reached this stage when, pending the outcome of the Federal investigation, all production was stopped the middle of last April.

Thomas Midgley Jr. worked out the formula for tetraethyl lead in the du Pont plants while employed as a chemist by the General Motors, of which the du Ponts own 7,000,000 shares, about one-third. This was three years ago, and soon afterward the du Ponts began production at the old dye plant at Deep Water. Subsequently officials of General Motors and the Standard Oil of New Jersey organized the Ethyl Gasoline Corporation, in which the du Ponts had no interest save through their holdings of General Motors stock, and began production at the Bayway plant, near Elizabeth, N. J. There was a commercial rivalry between this plant and that at Deep Water, although the Bayway factory was the smaller. The du Ponts employed as many as 300 men in their tetraethyl plant at one time, but its sixteen units never reached full production.