HISTORY OF THE DAYTON PROJECT

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Monsanto Research Corporation

A Subsidiary of Monsanto Company

MOUND LABORATORY

Miamisburg, Ohio

Operated for

United States Atomic Energy Commission

U.S. Government Contract No. AT-33-1-GEN-53

The development of the $60-million Atomic Energy Commission production and research facility in Miamisburg can be traced to an origin in 1926 when the Thomas and Hochwalt Laboratories were established in Dayton. This firm was acquired by Monsanto Chemical Company in 1936 to carry on long-range and fundamental scientific study on a company wide basis.

In March 1939, only a few weeks after the discovery of uranium fission, the possible military importance of atomic energy was called to the attention of the U. S. Government. In the autumn of 1939, the first Government committee on uranium was created. The initial work was done in various universities with the overall effort being somewhat loosely organized. By the end of 1941, an extensive review indicated that an increased effort on the uranium project should be undertaken under the administration of a more formal organization. This decision was approved by President Roosevelt. In the summer of 1942, the Army Corps of Engineers organized the Manhattan Engineer District for this purpose.

Charles A. Thomas,
Project Director,
1943 - 1945.

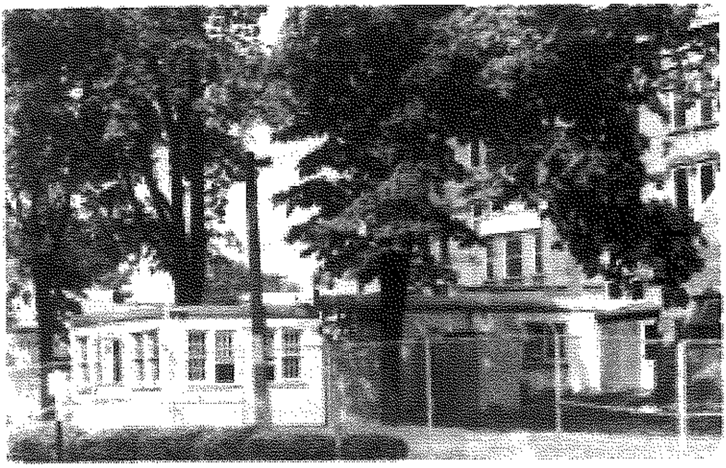
Dr. Charles Allen Thomas was director of Monsanto's Central Research Department in Dayton when, in 1943, he was called to Washington for a conference with General Leslie Groves. Groves had been assigned responsibility for the Manhattan Project in September, 1942. Also present at the conference was James Conant who had been president of Harvard University prior to his appointment to the National Defense Research Committee. After swearing Thomas to secrecy, they revealed to him the top secret plan to build an atomic bomb. Following several days of meetings and discussions, Monsanto accepted the responsibility for the chemistry and metallurgy of radioactive polonium—work to become known as the Dayton Project.

Polonium was vital to the construction of an atomic bomb as a

the staircase from the second to the third floor was missing).
Also, extensive renovation was necessary to fit the building for service as a chemical research laboratory. This site became known as Unit III and all activities were transferred in October 1944.

A lack of scientific equipment plagued the project from the outset. Total initial laboratory supplies at the Seminary building consisted of a "bushel basket" filled with assorted chemical glassware. One of the major jobs in the early days was procuring necessary equipment to stock a research laboratory.

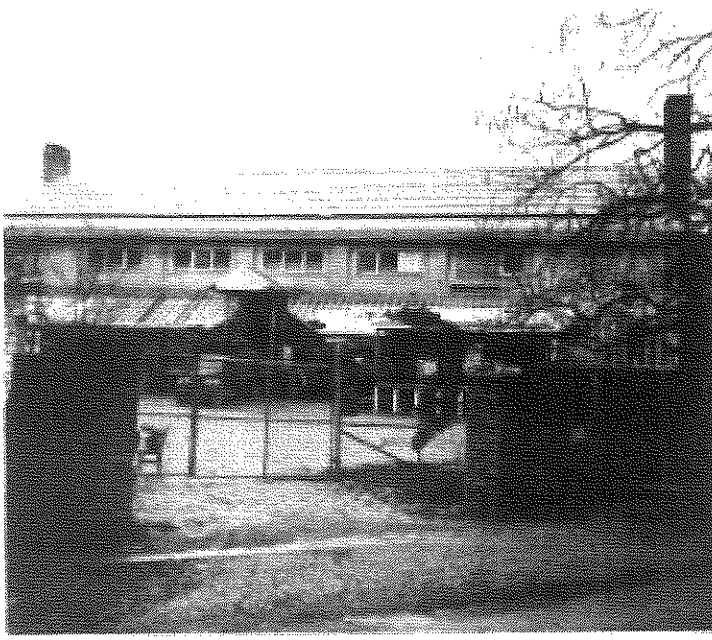
Going away party for W. C. Fernelius at Unit III. Shown l. to r. are Joseph Spicka, Ed Larson, Fernelius, Carl Rollinson, Malcolm Haring and Joseph Burbage.



Unit III site in 1948. Cafeteria is shown in foreground and corner of physics building in left foreground.

This was no easy job with the war on, and it was made more difficult due to the secret nature of the project. No official priority rating was obtainable because any official relationship with the Manhattan Engineer District had to be avoided for security reasons. Fortunately, a statement that Monsanto was engaged in critical government work was normally adequate to obtain the necessary materials. Where this failed, scientists either improvised or managed to get by without the equipment. All Manhattan Project work at Dayton was secret and the security regulations were rigid. Armed guards were on-site 24 hours a day to prevent unauthorized access to the laboratory. Employes were not authorized to discuss the nature of their work away green cork floor, a stage, a squash court, lounges, and an outdoor swimming pool.

To quell the neighbors' complaints, no deliveries were made to the site by commercial carriers. Rather deliveries were made to Unit III, where they were reloaded onto smaller government vehicles and shuttled to Runnymeade. Still, the installation



Loading dock at Unit IV. Shipments were shuttled from Unit III using small government vehicles. Corrugated glass roof is visible in the background.

of security fencing, 24 hour per day exterior lighting and armed guards patrolling the site displeased the neighbors, who had no idea of the urgency of the processes being conducted inside the fence.

Extensive alterations to the exterior of the main building were not required, but the interior presented many problems in constructing process facilities and laboratories. Care was exercised in making as few changes as possible in the building to alleviate the problem of restoration upon vacating the site. Precautions were taken to minimize annoyances such as noise, smoke and dirt to avoid undue criticism from the residential area.

It became known, however, after the explosion of the first atomic weapons, that the work at the playhouse utilized radioactive material. The citizens of Oakwood showed a good bit of concern and the frequency of complaints increased markedly. "We found a dead bird in our yard, it must have flown over your plant. Please come over and check it." "There is some brown dust on my porch. You had better look into it." are examples. One resident called to complain that the side of her home was becoming discolored and asked Monsanto to investigate. A local testing laboratory was hired to examine the situation and reported that the problem was caused by rusting window screens and had no relationship to work of Runnymeade. It is significant to note that not a single accident occurred at either Monsanto location causing any injury to the public.

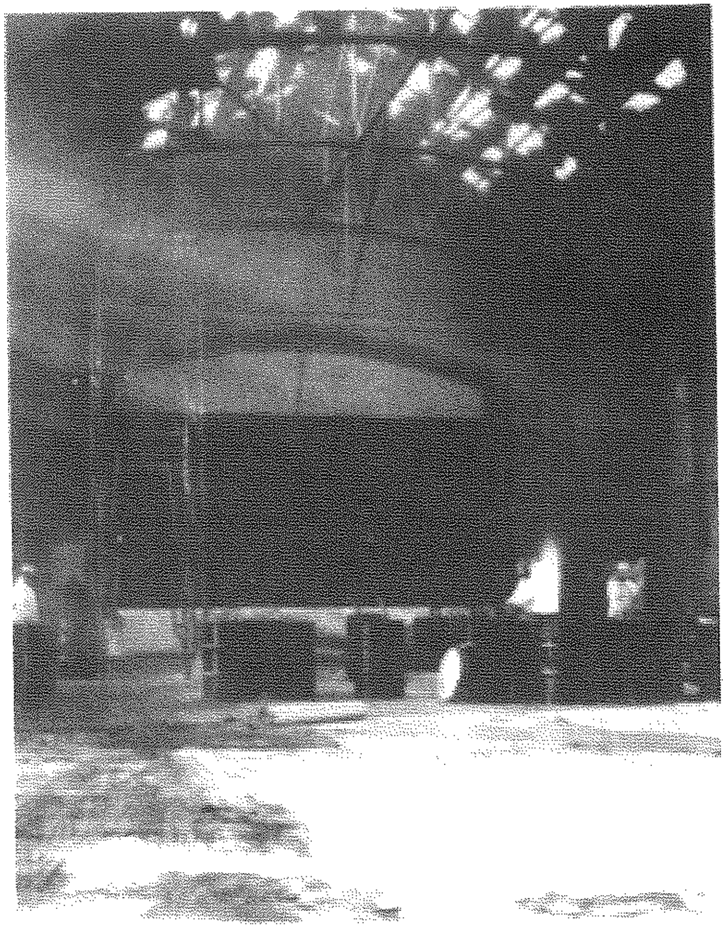
Great care was taken to assure the safety of the surrounding areas. Trucks equipped with radiation detection equipment made regularly scheduled runs throughout the greater Dayton area. Even as far as 75 miles distant, air and soil and water were sampled to ensure that radioactivity was not released in the community.

Radioactivity in the laboratory had to be carefully controlled. Here, scientists were working with the largest amounts of polonium ever isolated, and the associated radioactivity was significant. Employes who were exposed to significant amounts of radioactivity on a daily basis were checked regularly both for their own health, and to assure that no contamination was leaving the laboratory and entering the community.
Schedules were established for delivery of the purified polonium which were exceptionaly hard to meet. It became an art to delay the courier arriving to pick up the polonium. Some deadlines were so close that an employe would be sent to talk with the courier and to keep him occupied while the final touches were put on

the packages. Still, all commitments were met and shipments were made on schedule.

As early as 1946 it became evident that a permanent polonium production facility was needed. Thus a project which some thought might last only six months had grown to a state of permanence. Among the locations considered for the proposed facility was a site midway between the atomic plants at Los Alamos, New Mexico and Hanford, Washington. A Tennessee location near the Oak Ridge Atomic plant was also investigated. The Dayton area was finally selected for a number of reasons among which were a good supply of skilled labor and adequate water and power supplies. The site selected for Mound Laboratory was on a hill 878 feet above the sea level and about 200 feet above the Miami River in Miamisburg, Ohio. Adjacent to the laboratory is the largest conical Indian mound in the state of Ohio. From this prehistoric burial gound the laboratory derived its name.

Mound Laboratory became the first permanent Atomic Energy Commission facility when it was first occupied in May 1948. There were, in total, 14 major buildings constructed in the original $25.5-million complex with a total floor area of 366,000 square feet. Polonium processing was started in February 1949.



Interior of Unit IV during dismantling operations. All material was loaded into 55 gallon drums for removal from the site. The stage is visible in the background.

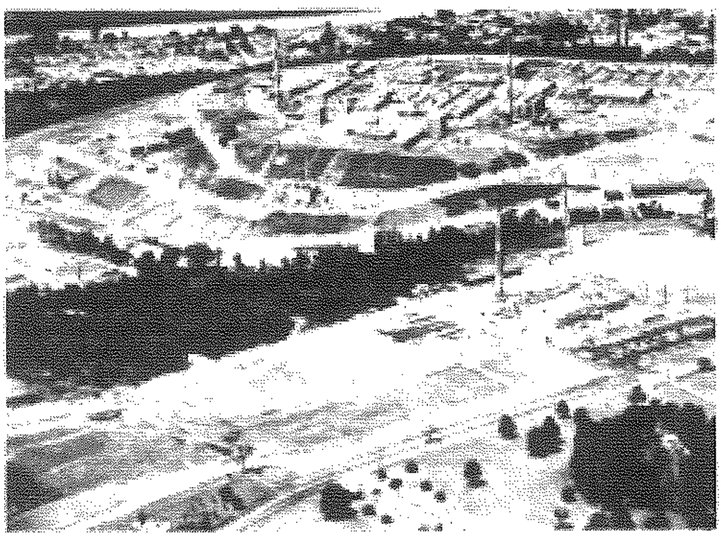
John Bradley Director of Explosives Operations, holds the knob to the front door of Runnymeade Playhouse. Bradley came to the Dayton Project with the Army's Special Engineer Detachment in 1945.

Production of plutonium-238 grew out of our early work with polonium-210. Plutonium-238 is processed in unprecedented quantities to supply a burgeoning demand for heat sources to be used in thermoelectric energy conversion systems. The basic physical, chemical, and nuclear properties of these nuclides are being studied intensively. Our experience in handling radioactivity led also to research with plutonium-239, a fuel for nuclear power reactors.

The isotopic heat source programs began with the development of a small thermoelectric generator powered by a radioactive isotope. Satellites orbiting the earth are confirming the potential of isotopic generators which convert isotopic heat to electrical energy. By the early sixties the Laboratory was firmly established as the country's leading manufacturer of these power sources.

The separation of stable isotopes of the noble gases utilizing thermal diffusion of gases began as an expansion of our isotopic research in the mid-fifties. By 1964 theoretical and applied research had established the Laboratory as the free world's chief supplier of these isotopes.

As new programs appear MRC will continue to diversify in its research, development, and production for the Atomic Energy Commission. As new applications are found for isotopes in space exploration, medical research, and other technical frontiers, Mound Laboratory will create its future.



Aerial view of Mound Laboratory.