MALLINCKRODT CHEMICAL WORKS, Building No. 25
(Mallinckrodt Inc.)
Corner of Second Street and Salisbury Street
St. Louis, Missouri

HABS No. MO-1929-G

HABS
MO
96-SALU,
134G-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Buildings Survey
National Park Service
Great Plains Support Office
1709 Jackson Street
Omaha, Nebraska 61802-2571

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HISTORIC AMERICAN BUILDINGS SURVEY

MALLINCKRODT CHEMICAL WORKS, BUILDING 25

(~~Mallinckrodt, Inc.~~)

HABS No. MO-1929-G

Location: Northeast corner of Second and Salisbury streets, St. Louis, Missouri

USGS Granite City, Illinois-Missouri Quadrangle (7.5'), Universal Transverse Mercator Coordinates: 744179 E; 4282895 N

Present Owner: Mallinckrodt Inc.

Present Use: Laboratories, administrative offices

Significance: One of 16 buildings at Mallinckrodt Chemical Works associated with the Manhattan Engineer District/Atomic Energy Commission (MED/AEC) —sponsored program to process uranium for use in the development of atomic weapons, Building 25 housed the research laboratories where experiments to purify uranium took place. The results of this research enabled the MCW scientists to develop large-scale production operations.

PART I. HISTORICAL INFORMATION

A. Physical History

1. **Date of erection:** Building 25 was built in 1935.

2. **Architect:** The architect of the building was Jamieson and Spearl, of St. Louis, Missouri.

3. **Original and subsequent owners:** The original and subsequent owner is the Mallinckrodt Chemical Works.

4. **Builder-contractor:** The contractor is unknown.

5. **Original Plan and construction:** Built in 1935, this building, measuring 54'-8" x 159', was a laboratory.

6. **Alterations and additions:** The windows on the south side's first floor have been infilled with metal. The old windows have been replaced with new windows.

B. Historical Context

Building 25 was first used for uranium processing in April 1942, when Mallinckrodt Chemical Works (MCW) began experiments to purify uranium. The research laboratory on the second floor at the north side of the west end was used for this work. Quality control took place in the laboratory on the third floor at the north side of the west end. Initial efforts were concentrated on extracting impurities from uranyl nitrate using ether. By May, a research and development team was established for this secret work; the scientists involved, under the direction of Dr. John Ruhoff and Dr. H.V. Farr, were Donald Alnutt, James Boyd, Dr. Charles Conard, Dr. Charles D. Harrington, Louis Kaplan, Dr. Jack Kyger, John Lemp, Gerald Reid, William Rosenbaum, Samuel M. Tuthill, and Dr. Charles Winters. The laboratory work demonstrated that a good separation of uranyl nitrate from impurities was possible by using the ether extraction method. The researchers then built a prototype in the alley between Buildings 25 and K to try the extraction on a larger scale than was possible in the laboratory. This prototype consisted of a stainless steel two-inch diameter pipe that was 8 feet long; into this pipe ether, water, and uranyl nitrate were placed and mixed by a pump. When the pump was stopped, the layers of water and ether separated and the water was drawn off. The uranyl nitrate crystals from this process were tested for

purity at Princeton University, the University of Chicago, and the National Bureau of Standards , and passed every test. As a result of this research and pilot plant operation, a large-scale operation was developed in buildings 51 and 52.[1]

The laboratory on the second floor of Building 25 was also used for uranium experiments beginning in July 1944 when MCW was developing a method for extracting and purifying uranium from high grade pitchblende ore from the Belgian Congo.[2] Once development work for the process had been completed in the laboratory, a pilot radium extraction plant was established in Building K-1-E.

PART II. ARCHITECTURAL INFORMATION

A. General Statement

1. **Architectural character:** Building 25 is a 1930s industrial building.

2. **Condition of fabric:** The fabric is in good condition.

B. Description of Exterior

1. **Overall Dimensions:** Building 25, a three-story building, is rectangular in shape and measures 54'-8" in width x 159' in length. A third-floor passageway connects the west wall with Building 91-2. A second-floor passageway connects the south wall to Building K.

2. **Foundation:** The foundation is raised concrete.

3. **Walls:** The walls are brick with concrete piers and beams.

4. **Structural system, framing:** Building 25 uses concrete piers and beams with a window wall infill.

5. **Porches and steps:** A concrete porch with three steps and pipe railings is located on the south side of the building.

6. **Chimneys:** There are no chimneys.

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1 John Ruhoff, "The First Fifty Critical Days," *Uranium Division News,* June 1962: 5-8; personal communication, Samuel M. Tuthill, Ph.D., Retired consultant, Technical Committees and Quality Standards, Mallinckrodt Inc. [December 12, 1996].

2 Mont G. Mason, "History and Background Relative to the Radiological Re-Monitoring of Mallinckrodt by the Energy Research and Development Administration" (St. Louis: Mallinckrodt, Inc., 1977), 14.

7. **Openings:**

   a. **Doorways and doors:** Building 25 has three exterior doors on the south side: two metal doors with 9" wire glass windows, and one overhead metal door.

   b. **Windows:** There are banks of four fixed-pane windows in anodized aluminum frames, with upper metal panels of blue, recessed between concrete piers, on the north side. Fixed-pane windows in anodized aluminum frames with upper metal panels of blue, with two windows between each pier, are found on the south, east, and west sides of the building.

8. **Roof:**

   a. **Shape, covering:** Building 25 has a flat roof.

   b. **Cornice, eaves:** There is a cast concrete cornice on a parapet roof.

   c. **Dormers, cupolas, towers:** There are no dormers, cupolas, or towers.

C. **Description of Interior**

1. **Floor plans:** There are three large laboratory spaces, one per floor, with numerous offices of various sizes.

2. **Stairways:** The interior stairways are tile over concrete.

3. **Flooring:** The building's concrete floors have been covered with carpeting or linoleum.

4. **Wall and ceiling finish:** The walls are covered with paint. The dropped ceilings have acoustic tiles.

5. **Openings:** The doors are metal with upper glass panes. The original doors are oak with upper glass panes.

6. **Decorative features and trim:** There are no decorative features and trim.

7. **Hardware:** There is no hardware.

8. **Mechanical equipment:**

   a. **Heating, air conditioning, ventilation:** The building is heated with steam heat from Building C in Plant 1.

   b. **Lighting:** The lighting consists of flush-mounted fluorescent fixtures in dropped ceilings. The original lights were enamel shades with ceiling fans.

   c. **Plumbing:** It is not known whether the plumbing fixtures in the bathrooms are original.

9. **Furnishings:** Some of the original oak laboratory benches remain. Uranium work was done in the first floor, east, and second floor, west, laboratories. The third floor, east, contained Mr. Edward Mallinckrodt's experimental laboratory.

D. Site:

1. **General setting and orientation:** Building 25 is a 1930s infill within the original Plant 1 of Mallinckrodt Chemical Works. It is oriented east/west along Salisbury Street.

2. **Historic landscape design:** The building is part of the Mallinckrodt Chemical Works, and is set within an urban industrial area with no landscape design.

PART III. SOURCES OF INFORMATION

A. Original Architectural Drawings: Original drawings for Building 25 are located at Mallinckrodt Inc. Engineering Department, Building 91-2. The earliest architectural drawings, July 31, 1935, MCW No. 4623-201-001 through 004, were floor plans, elevations and sections, roof plans, and plumbing plans.

B. Bibliography:

Construction drawings MCW No. 4623-201-001 and 002. Mallinckrodt Inc. Engineering Department. 31 July 1935.

Mason, Mont G. "History and Background Relative to the Radiological Re-monitoring of Mallinckrodt by the Energy Research and Development Administration." St. Louis: Mallinckrodt, Inc., 1977.

Ruhoff, John. "The First Fifty Critical Days." *Uranium Division News.* June 1962: 3-9.

Tuthill, Dr. Samuel, Retired consultant, Technical Committees and Quality Standards, Mallinckrodt Inc. [December 12, 1996]. Personal communication.

PART IV. PROJECT INFORMATION

This HABS documentation project was undertaken as mitigative recordation required by Section 106 of the National Historic Preservation Act of 1966. The United States Department of Energy Former Sites Restoration Division plans to demolish the buildings.

The documentation was prepared by Alexandra C. Cole, architectural historian at Science Applications International Corporation (SAIC), Santa Barbara, California, in February 1997. Large-format photography was done by Bruce Harms of Louis Berger and Associates, Inc., Marion, Iowa, in August/September 1996. Measured floor plans were prepared under the supervision of Michael Poligone of Bechtel National Incorporated (BNI), Oak Ridge, Tennessee, in December 1996.

*FOR SITE PLANS SEE MO-1929 FIELD NOTES