

## THE CML STORY

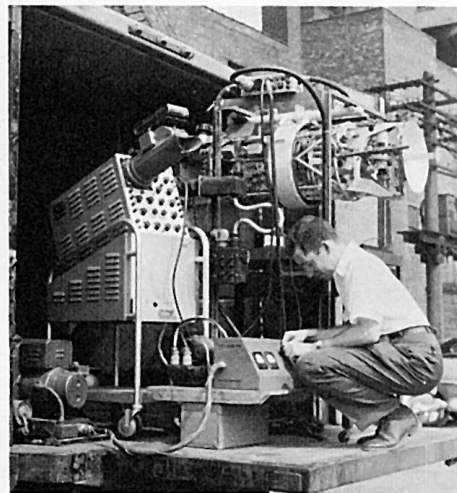
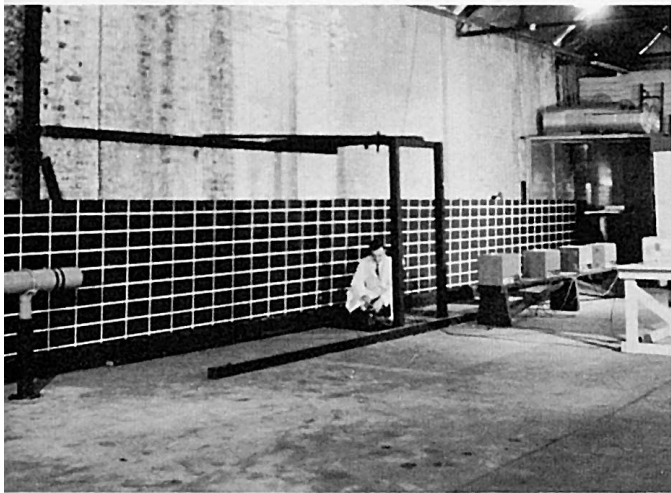
Following its successful launching of the Institute for Air Weapons Research, the University of Chicago entered into still another area of military research. The Korean conflict produced certain problems of warfare related to the Tactical Air Command. In May, 1951, recognizing that the University of Chicago was in a position to contribute to the solution of these problems through research, the Air Force entered into an agreement with the University for the establishment of Chicago Midway Laboratories. CML was to be operated by the University under a single Air Force contract. The mission of the Laboratories as originally stated was:

Conduct investigations, studies, research, and experimentation, and make recommendations in the broad field of

tactical air operations. Included in this project will be tactics, weapons, systems, equipment, organizations, and other phases of interest to the Air Force.

After personal investigation of the Korean situation, CML scientists began to concentrate on the problems of night seeing and the destruction of heavily armored vehicles from the air. CML's efforts on these problems have brought forth a low-altitude bombing system for antitank warfare and outstanding accomplishments in infrared cells and infrared seeing devices.

By the summer of 1952 the Laboratories had three buildings comprising 66,000 square feet of floor space devoted to office, laboratory, and developmental work areas.



In 1953 the program of the Laboratories was reviewed. Upon renewal of the Air Force contract, the scope of CML operations was widened to include air armament. CML was made directly responsible to the newly established Air Research and Development Command.

In 1956 Chicago Midway Laboratories was released from its single-contract arrangement with the Air Force and permitted to solicit work from any agency or contractor of the armed forces. CML thus became free to undertake research and development work on a prime-contractual basis with various government establishments and to do subcontractual work with industries involved in government projects.

CML has grown considerably since 1951. The present program includes such items as research and development in armament devices and systems; detection, tracking, and reconnaissance devices and systems; and fundamental work in solid-state physics and physical electronics. The increased emphasis on system development has resulted in an expansion of the Engineering and the Electro-optical Systems divisions. Much of CML's work is classified in nature; the clearance classification of the Laboratories is TOP SECRET.

A reciprocal working relationship is maintained among the three technical divisions so that the fullest competence is brought to bear on each project, regardless of administrative cognizance.

The material published in this brochure can be only suggestive of the scope of the activities within the divisions. Security considerations prohibit any representation of many of CML's accomplishments.

## **Personnel**

Chicago Midway Laboratories is operated by a full-time staff of approximately two hundred, including a hundred and fifty scientists and engineers who have an enviable record of contributions to the advancement of science in fields directly related to CML's present program. Many of the senior members, whose professional experience averages more than eleven years, have published scientific papers in the open literature or doctoral dissertations in related fields. The professional experience of the scientific personnel averages seven years. Selective recruitment has given CML a staff with diverse technical competence, and this attribute is utilized to the fullest.

## **Facilities**

The physical plant of the Laboratories is represented by a capital investment of over \$1,000,000, including more than \$800,000 in scientific equipment and machine tools. In addition to the facilities located in the main building, CML maintains an outstanding Development Shop. Moreover, the University's Central Development Shop is utilized by CML.

# THE DIRECTOR'S OFFICE

## I. The Office

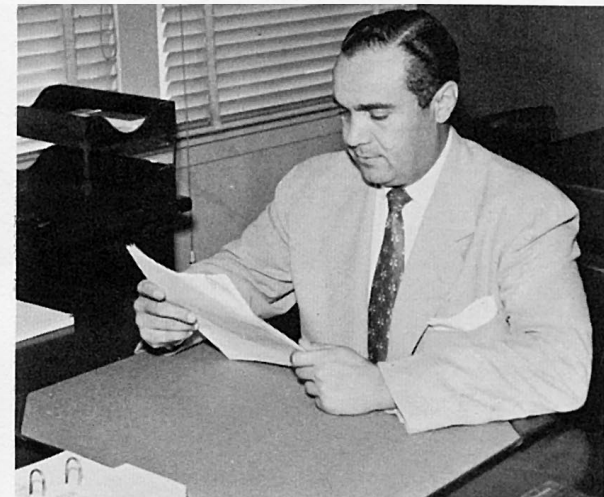
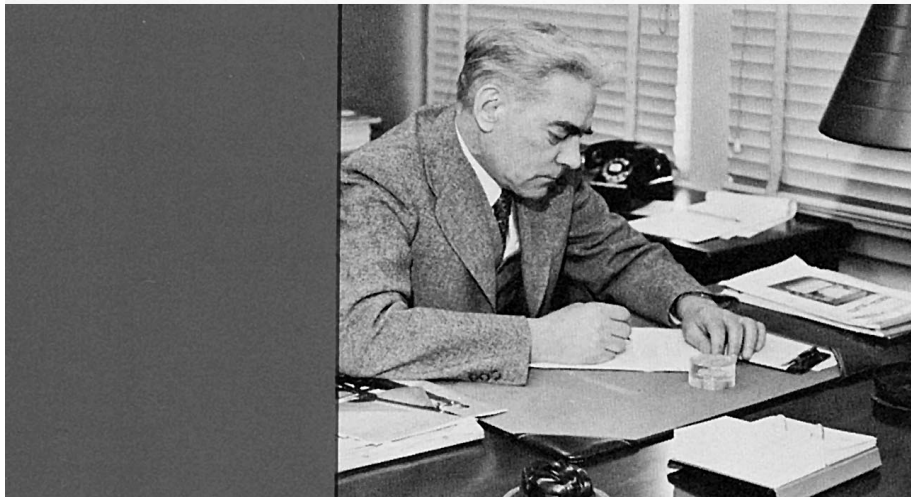
Top-level management of both personnel and projects is performed by two experienced administrators capable of effectively supervising the operation of the Laboratories and formulating the long-term plans required for an organization that is consistently in the forefront of scientific endeavor.

## II. The Men

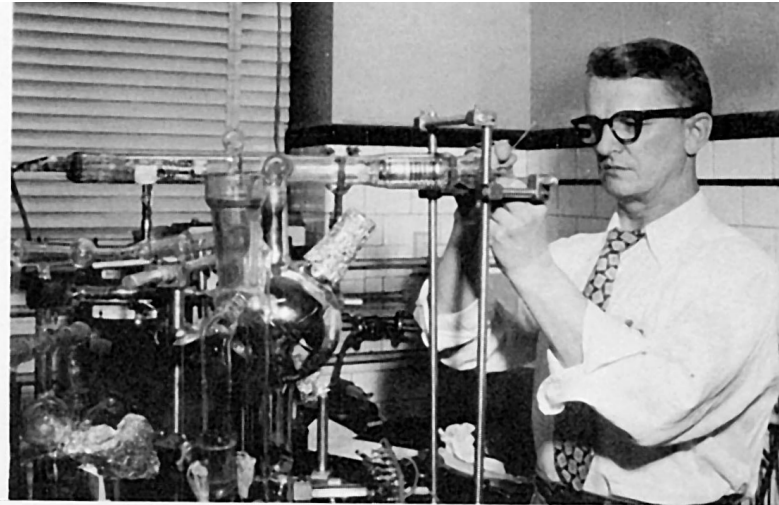
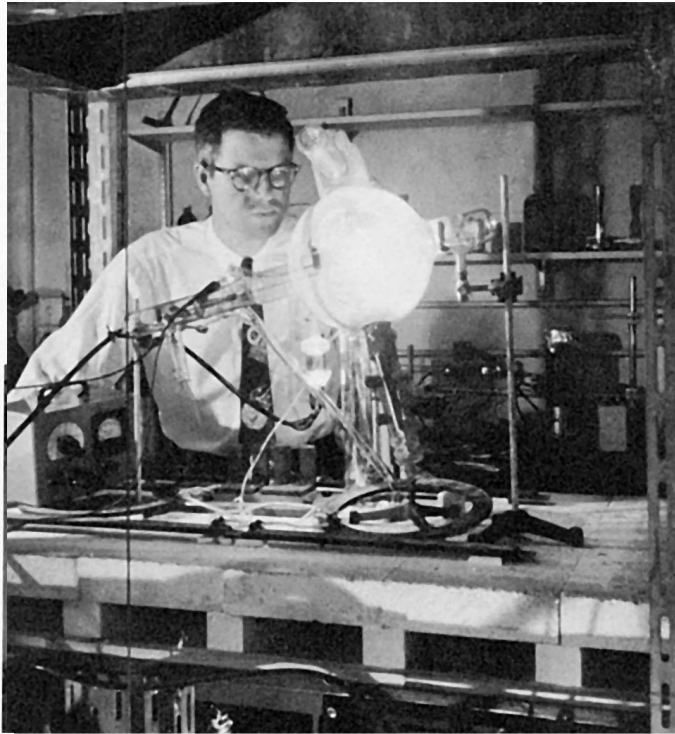
*The Director.*—Thorfin R. Hogness was a member of the chemistry department at the University of California from 1919 to 1930. He then came to the University of Chicago and in 1937 was awarded a full professorship in the Department of Chemistry. During World War II he served as scientific liaison officer in London at the Office of Scientific Research and Development. He was later employed as civilian intelligence officer attached to ETOUSA. In 1943 Dr. Hogness organized the Maryland Research Laboratory operated by Ford, Bacon and Davis, Inc., for the National Defense Research Committee and the Office of Strategic Services. For the next three years he

served as director of the Chemistry Division of the Manhattan District Plutonium Project. On his return to the University of Chicago, Dr. Hogness was instrumental in establishing Chicago Midway Laboratories.

*Associate Director.*—Sebastian J. Nicolosi was engaged in the development of armor and ammunition of all calibers at Aberdeen Proving Ground during the war years 1941–45. Immediately after World War II, he was transferred to Watertown Arsenal, where he spent two and a half years working on the design and development of superior high-velocity armor-piercing ammunition. Mr. Nicolosi returned to Aberdeen in 1948 to do research and development work on artillery weapons, rockets, launchers, and JATO's. In 1951, as a research engineer at the Armour Research Foundation, he conducted evaluation studies of automatic aircraft weapons and ammunition and worked on the design and development of rocket-assisted ammunition. Mr. Nicolosi joined the staff of Chicago Midway Laboratories in May, 1953. As Chief Engineer, he was primarily concerned with two projects: a low-altitude tactical bomb munition (HEP bomb) and the suspension and release of external stores from high-speed aircraft. In August, 1954, he was appointed Associate Director of the Laboratories.



## Representative Activities



The secondary emission of electrons in both its fundamental and its applied aspects is a continuing interest of the Division. Extensive research is being done on the emission of electrons from "ideal" surfaces of very pure metals. Maintenance of pure surface conditions requires full use of the techniques of ultra-high vacuum. The employment of secondary emission to effect direct amplification of a photoelectric image has been the subject of an exploratory development study.

The semiconducting compound indium antimonide has been of major interest to the Division: Chicago Midway Laboratories has been a leader in producing single crystals of high purity. Indium antimonide crystals produced at CML have been the subject of numerous research projects here and in other R/D laboratories throughout the country. The usefulness of indium antimonide in detectors of infrared radiation was first demonstrated at CML. Other semiconductors with which the Physics and Chemistry Division has been or is now concerned are lead sulfide, lead selenide, indium arsenide, and gallium arsenide.

The detection of thermal radiation is a third field of interest. A phase of this development is the employment of the pyroelectric effect in a thin membrane in conjunction with the electron-scanning techniques of conventional television cameras.

