

Tour Guide

John Wesley Powell
Federal Building

U.S. Department of the Interior
Geological Survey
National Center
Reston, Virginia

To Our Guests

On behalf of each employee at the Geological Survey's National Center, I extend a warm welcome to you during our "Open House."

We hope that your visit to our headquarters will be a pleasant and rewarding experience, will provide insight into our scientific research which is directed towards helping to solve some of the critical environmental and natural resource problems that face our Nation today, and will make you want to visit us again.

As a part of the Federal Government, we are deeply committed to the concept of public service. We are proud to serve you.

Sincerely yours,

V. E. McKelvey

V. E. McKelvey
Director



General Information

Reception Area—In the main lobby.

Information Area—In the Auditorium on the first floor. The tour of the building described in this booklet begins there.

Telephones—For calls within the building, use any extension phone; for outside calls, use the pay phones located on each floor.

First Aid—The Health Unit (extension 6141) is in Room 1-B-418, adjacent to the main lobby.

Lost and Found—In the Information Area.

Food and Beverages—In the Cafeteria on the basement level and at snack bars throughout the building.

Tour Guides, wearing identifying badges, will be posted throughout the building. They will be available to answer any questions you may have about the Geological Survey, its operations, and the National Center.



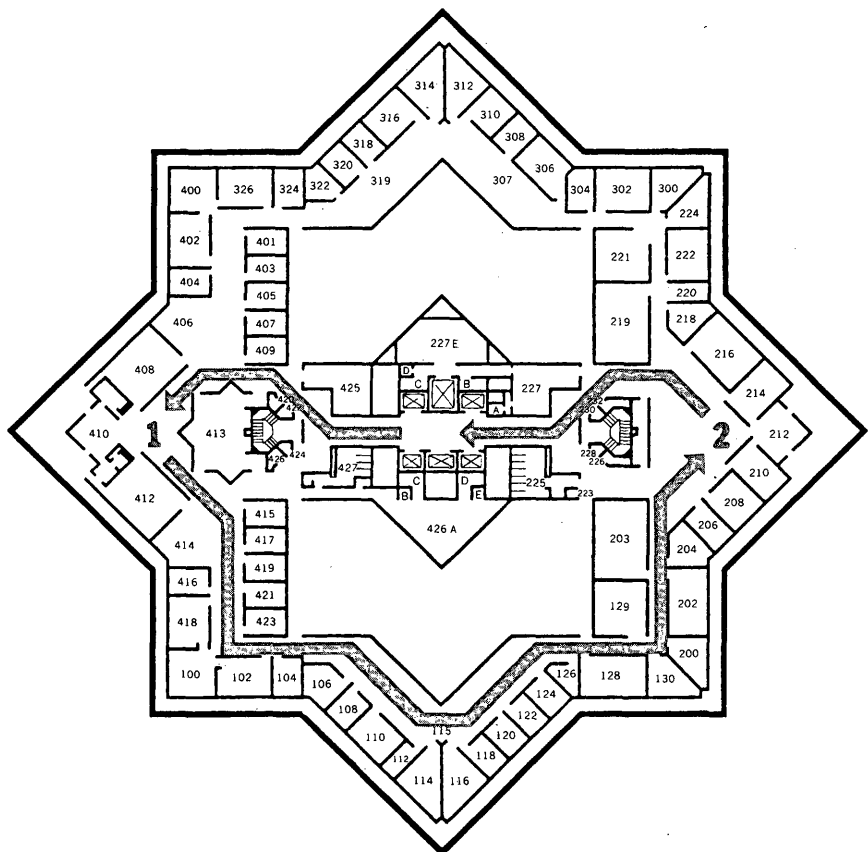
Seventh Floor

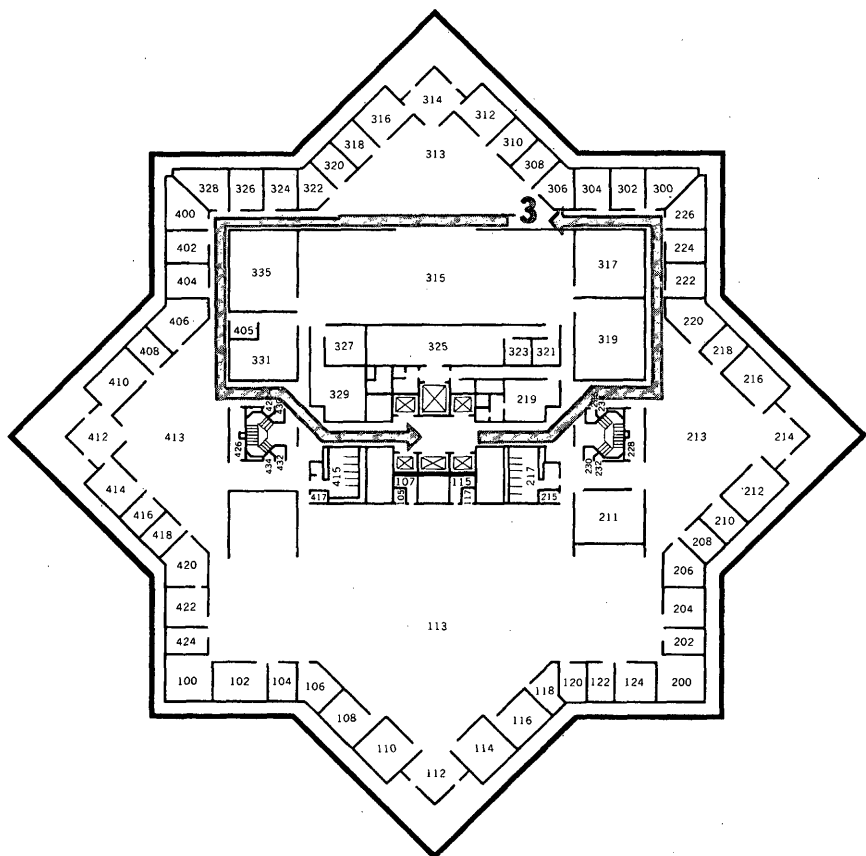
Stop 1—Office of the Director

These offices house the Director of the U.S. Geological Survey, Dr. V.E. McKelvey, and his staff. From here, the Director and his staff oversee and direct the varied activities of the Survey's numerous offices and programs, making certain that all work is carried out thoroughly, efficiently, and in a manner consistent with the public interest.

Stop 2—Conservation Division

The Conservation Division is responsible for classifying the public lands as to their value for leasable fuels and minerals. When a mineral lease or prospecting permit is issued to private individuals or corporations for operations on public, Indian, or Outer Continental Shelf lands, the Conservation Division becomes responsible for supervising extractive operations. Exhibits describing Division functions are displayed at this stop.





Sixth Floor

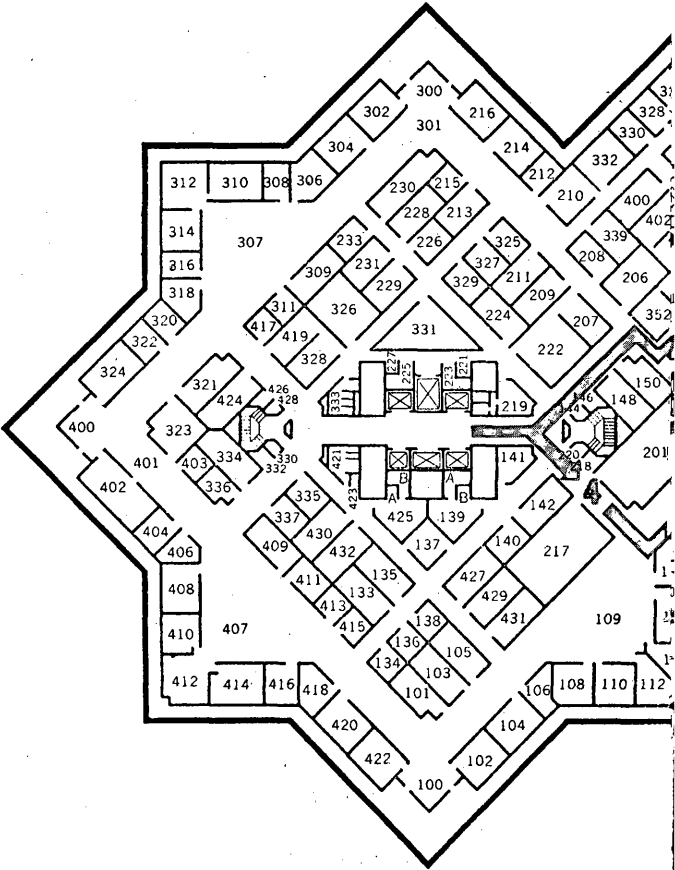
Stop 3—Computer Center Division

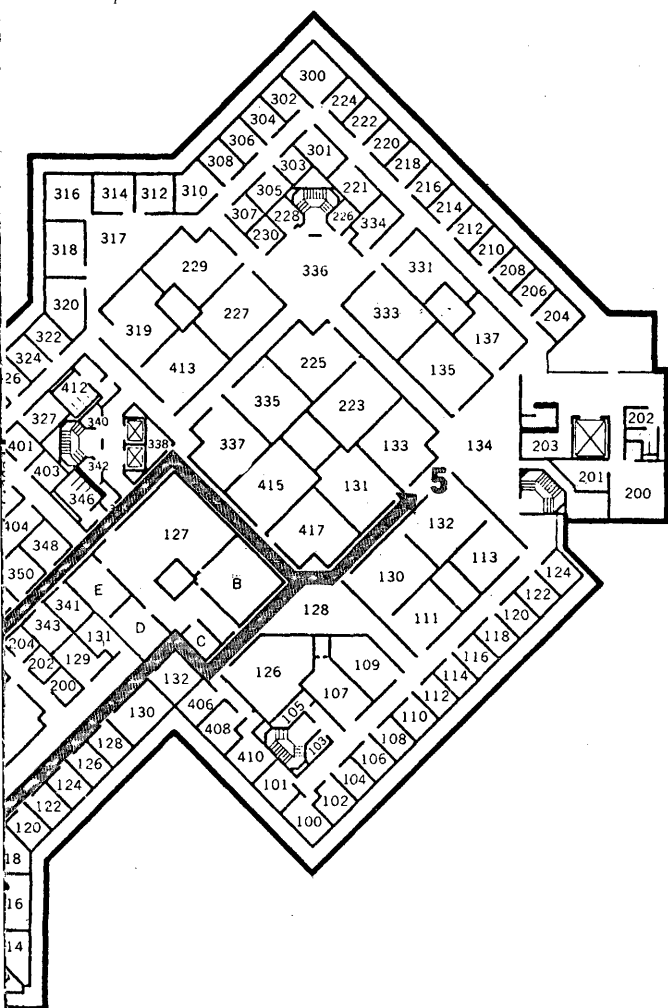
The Computer Center Division operates a "Nationwide Computing System" in support of the research and data-gathering activities of the Geological Survey and other Department of the Interior bureaus and offices. The nationwide system consists of two large-scale computers, one in Reston, Virginia, and the other in Washington, D.C. These computers are linked via telecommunications lines to over 100 computer terminals located throughout the United States. The Reston computer can be seen at this stop.

Fifth Floor

Stop 4—Water Resources Division

The Water Resources Division has the responsibility for evaluating the quantity and quality of the Nation's water resources. This continuing program, which began almost 90 years ago, produces information about flow and sediment discharge of rivers; location and availability of underground water; chemical, biological, and physical characteristics of the water; and supportive research. Such information is essential to the effective management of the water environment. Exhibits relating to this program are on display at this stop.





Stop 5—Ground-Water Simulation Laboratory

The ground-water simulation laboratory is the Water Resources Division's principal research facility for utilizing analog and hybrid-simulation techniques. Prior to the move to the National Center during the fall of 1973, the laboratory personnel completed more than 80 simulation studies of ground-water projects located throughout the United States. Current research is focused on the development of hybrid simulation of large three-dimensional ground-water systems.

Fourth Floor

Stop 6—The Survey Library

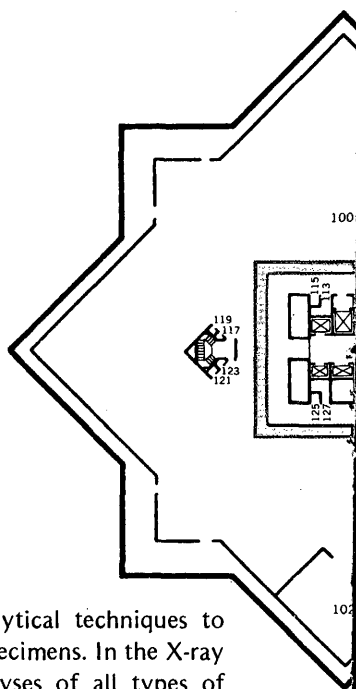
The U.S. Geological Survey Library, established in 1879, is one of the world's outstanding collections of geoscience literature. Although maintained primarily to support the research activities of Survey scientists, these collections are made available to Department of the Interior scientists, other Government agencies, universities, and research organizations throughout the country. On display is a sampling of the library's historic books in geology, some dating back to the 16th century.

Stop 7—Research Geologist's Office and Laboratory

The Geologic Division conducts diversified investigations to increase understanding of, and aid in the management of, the natural resources of the United States. Information gained from this work provides the basis for decisions relating to land use, urban planning, environmental programs, and natural hazards. At this stop, a typical research geologist's office equipped with modular wooden furniture is displayed. Nearby are a small geochemistry and petrology laboratory and one of the six multipurpose laboratories available to the research staff to prepare and test mineralogic and petrologic samples.

Stop 8—X-Ray Spectroscopy and Electron Microscopy Laboratory

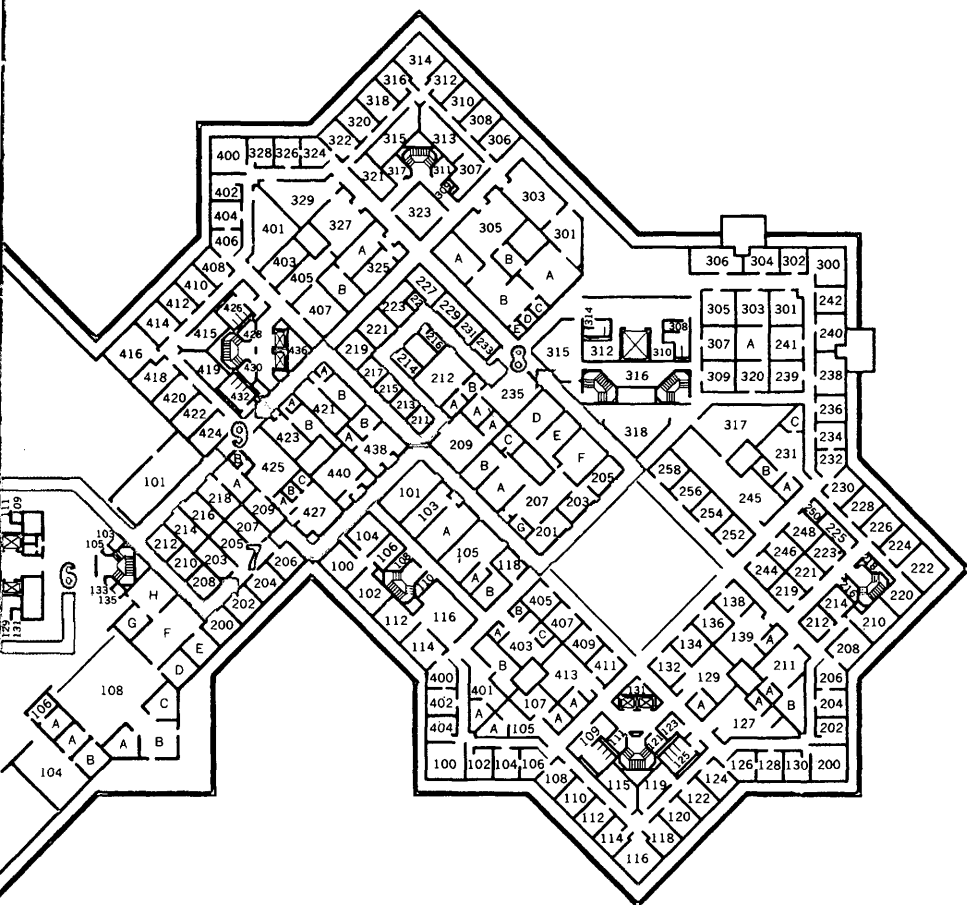
The Geologic Division employs many different analytical techniques to determine the chemical composition of rock and mineral specimens. In the X-ray spectroscopy and electron microscopy laboratory, analyses of all types of



geologic materials can be made. The following instruments are displayed: vacuum and air-path X-ray spectrometers, transmission (TEM) and scanning (SEM) electron microscopes, and a soft X-ray spectrometer. The following supporting laboratory areas can also be viewed: clean room, optical mineralogy laboratory, sample preparation room, and analytical chemistry laboratory.

Stop 9—Single-Crystal X-Ray Diffractometer

The laboratories of the Geologic Division offer sophisticated facilities for the modeling of geochemical processes and for the extensive analysis of extremely minute samples. At this stop, a single-crystal X-ray diffractometer, controlled by a minicomputer, is on display. This instrument system collects data that are used to determine the atomic structure of a mineral at a magnification of 1 billion. The characteristics of a mineral, such as hardness, cleavage, density, color, and optical properties, derive from the three-dimensional arrangement of its atoms in space. In this system, X-rays enter the tiny mineral fragment (0.1 mm on an edge) and are diffracted at angles unique to that mineral. The instrument



automatically positions the fragment at the appropriate angles, measures the diffracted intensities with a scintillation counter, and records the measurements on paper tape.

Second Floor

Stop 10—Computer Terminal

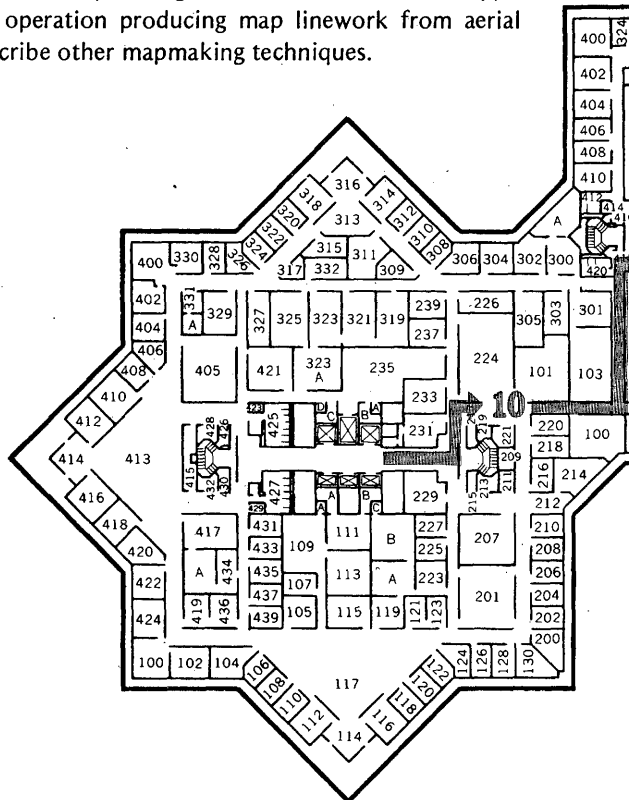
This is a moderate-speed remote computer terminal, one of 50 of its type in use in various locations. It is used to communicate with the large-scale computer on the sixth floor (Stop 3). This terminal provides ready access to computational support for various Topographic Division projects. The large-scale computer performs the necessary calculations and transmits the results to this terminal.

Stop 11—Stereoplotting Instrument

The Topographic Division's mission is to provide general-purpose basic maps, showing both the natural and man-made features of the Nation's land surface. These maps provide a starting point for many geologic and hydrologic studies and are popular with recreationists for planning their activities. At this stop, a stereoplotting instrument is in operation producing map linework from aerial photographs. Display panels describe other mapmaking techniques.

Stop 12—Cartographic Finishing Operations

At this stop, cartographic finishing operations are shown with selected display panels illustrating research and development in cartographic instruments, techniques, and products.

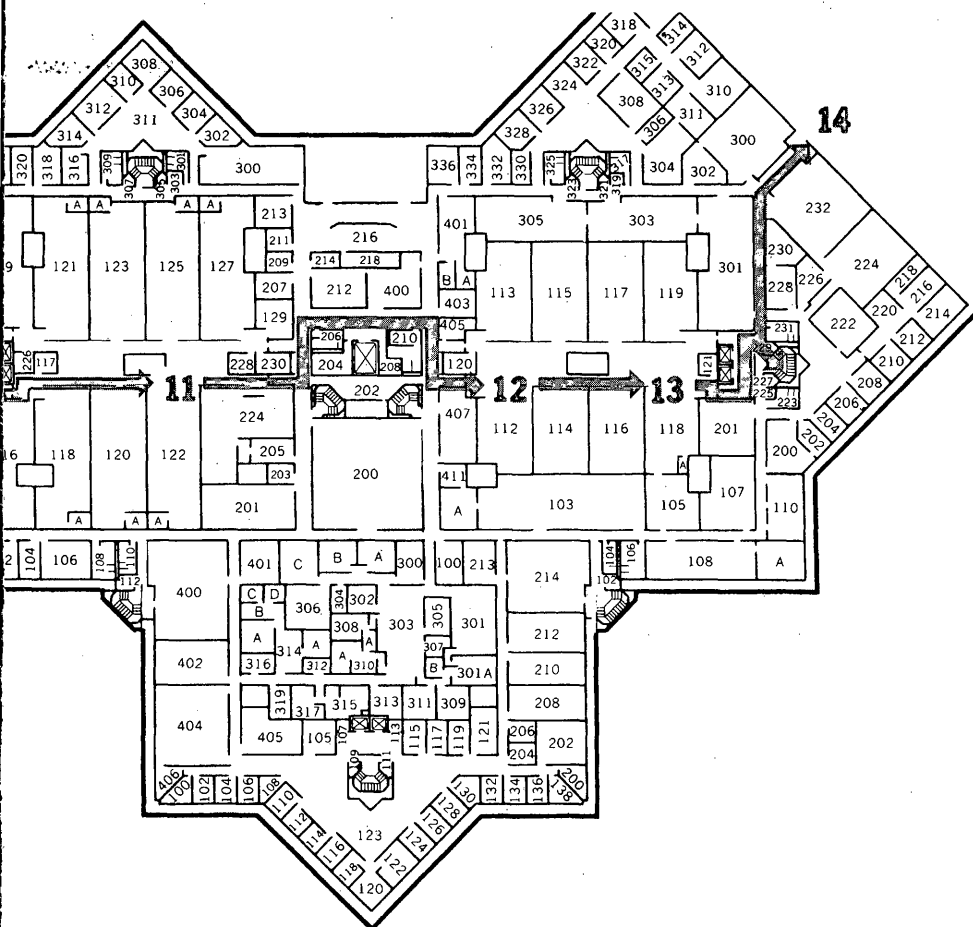


Stop 13—Geographic Applications Program

The Geographic Applications Program (GAP) within the Geological Survey has been developing various procedures for mapping and analyzing land use as an aid to planners and resource managers throughout the United States. Aerial photographs are the primary source of information. Displays at this stop show experimental products in the form of maps of general land use at 1:250,000 scale (1 inch = 4 miles) for use nationwide, demonstrations of several types of computerized land-use information systems, maps of land-use change, and comparisons of land-use data with related data such as the 1970 census of population.

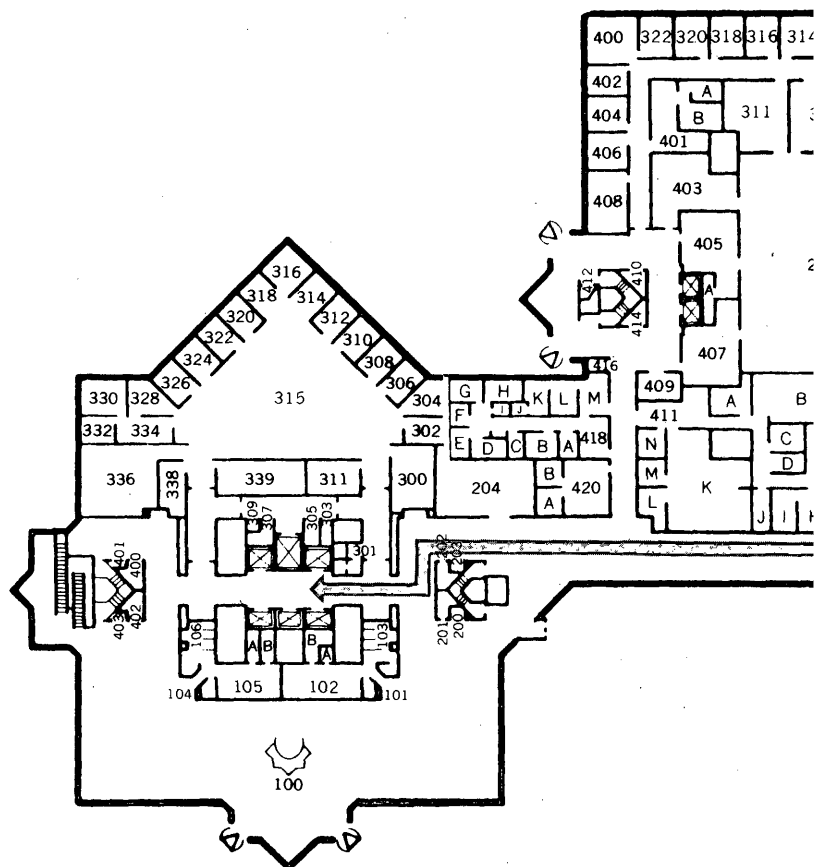
Stop 14—Publications Division

The Publications Division prepares and processes the printed materials through which the results of Survey investigations are disseminated to the public. Book manuscripts are submitted to the Government Printing Office for publication and distribution. Maps and atlases are produced by the Branch of



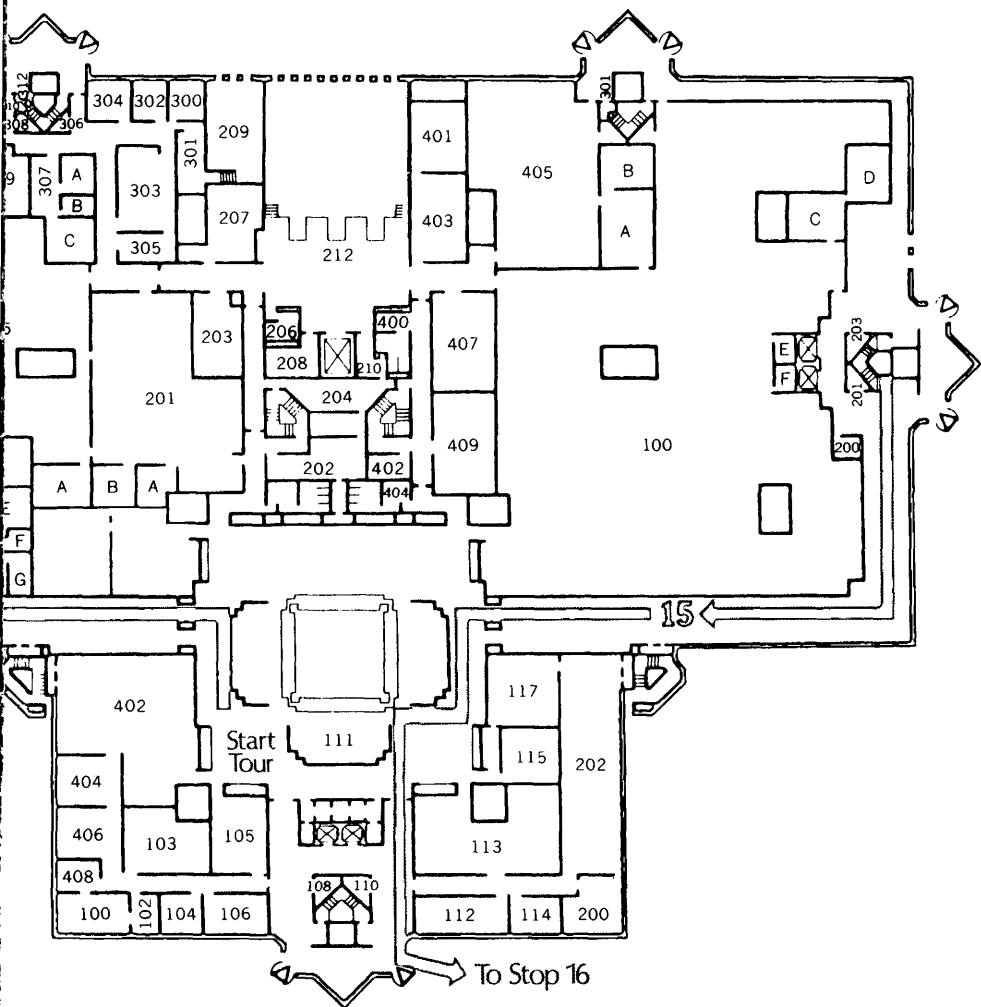
Printing in the printing plant in the 460-foot-long extension of this level. More than 10 million maps and about 500,000 copies of technical reports are distributed to the public each year. Typesetting and plate-engraving machines, and other equipment used to produce Survey publications, can be examined at this stop.

First Floor



Stop 15— Earth Resources Observation
Systems Program

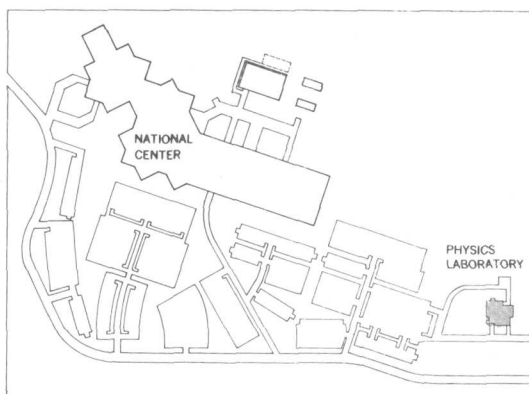
In 1966, the Department of the Interior established the EROS (Earth Resources Observation Systems) Program to gather and use remotely sensed data collected by satellite and aircraft in response to the critical need for greater knowledge of the Earth. This program, administered by the Geological Survey, is responsible for the reproduction and distribution of data to public users through the EROS Data Center in Sioux Falls, South Dakota. On display at this stop is the first mosaic of the contiguous 48 States ever assembled from satellite images. Space-age products that are being used to study the Earth's surface and natural resources are also exhibited.



Stop 16 – Solid State Physics Laboratory

A separate building housing about a dozen scientists, technicians, and administrative personnel is located adjacent to and southeast of the Powell Building. Here, as part of its mineral exploration program, the Geological Survey conducts research into the design and construction of analytical equipment using portable accelerators and neutron-emitting radioactive materials to make chemical analyses of samples in the field.

On the first floor, the truck-mounted mineral resource exploration system using neutron activation analysis in boreholes and a similar oceanographic exploration system are on display. In the bioenergetics laboratory on the second floor, a biological fuel cell system can be seen. The cell generates electrical power from a variety of carbon-containing sources including waste products and fossil fuels. A model of a bacteriologic system to promote secondary recovery of oil from oil fields is also displayed.







As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.