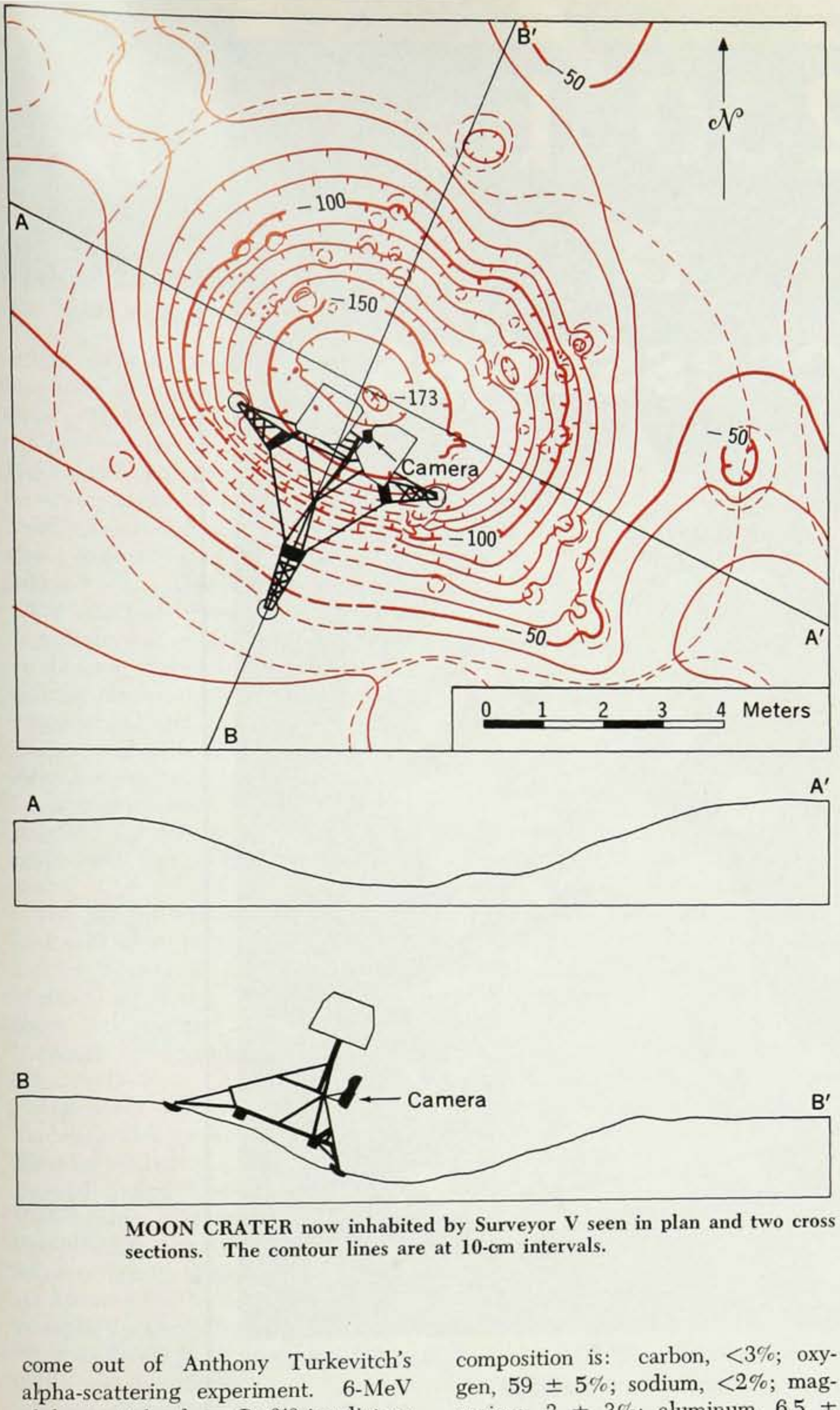


MOON CRATER now inhabited by Surveyor V seen in plan and two cross sections. The contour lines are at 10-cm intervals.

come out of Anthony Turkevitch's alpha-scattering experiment. 6-MeV alpha particles from Cm^{242} irradiate a 10-cm-diameter patch of the moon's surface and the energy of back-scattered alphas is measured by two detectors; there are proton detectors as well to monitor α,p reactions in the surface material. Characteristic alpha and proton energies enable a chemical analysis of this material to be made in terms of the relative atomic abundance of elements present. A disadvantage is that hydrogen cannot be detected.

Preliminary results show that the composition is: carbon, $<3\%$; oxygen, $59 \pm 5\%$; sodium, $<2\%$; magnesium, $3 \pm 3\%$; aluminum, $6.5 \pm 2\%$; silicon, $18.5 \pm 3\%$; all heavier elements, $13 \pm 3\%$.

This composition has been compared with terrestrial and extraterrestrial rocks; it agrees closely with common alkali basalt, the material that on earth appears as volcanic flow to the surface from the subcrust. It is clear from this analysis that differentiation (separation between crust and core) of the elements has occurred during complete or partial melting of the moon, which is therefore not in the pristine condition hoped for by some selenologists; their expectation that the moon could be used as a museum specimen to demonstrate the composition of the earth at its formation has not been fulfilled.

Dubna Scientists Report Discovery of Element 105

G. N. Flerov, director of the Dubna Laboratory for Nuclear Reactions, recently reported the discovery of element 105. At the Tokyo Nuclear Structure meeting in September, Flerov said that Dubna physicists had bombarded Am^{242} with Ne^{22} from the 300-cm cyclotron and produced either isotope 261 or 262 (they are not sure which one). The new isotope had a half-life of less than 0.1 sec and an alpha energy of 9.45 ± 0.15 MeV.

By the end of the year Flerov expects that modification of the 150-cm cyclotron will be complete; it will produce 15–20 MeV/nucleon. Then Dubna physicists will start looking for elements 114 and 126, both generally expected to be stable. Heavy-ion experts say the Russians may well be first to succeed since they will have at least a two-year headstart.

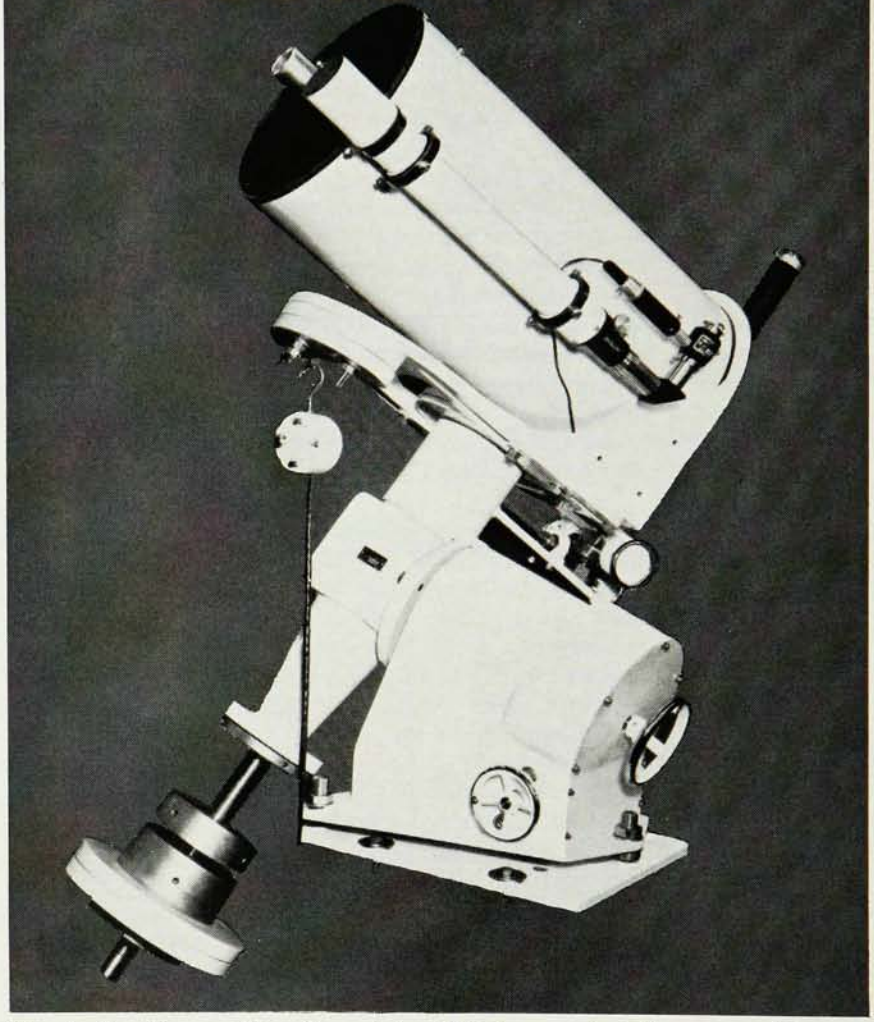
Bohr Institute Still Studies The Quantum and the Nucleus

The Niels Bohr Institute in Copenhagen is bigger today than it used to be when it was the Institute for Theoretical Physics. The name changed in 1965, when the founder's name was added, but the program remains about the same as it was in earlier days. The word "theoretical" was meant to mean "basic" as opposed to "applied," and its disappearance implies no change.

As always the institute concerns itself with a variety of aspects of quantum physics. Since Niels Bohr made his contributions to the understanding of compound-nucleus reactions and fission in the 1930's, there has been considerable emphasis on nuclear quantum phenomena. Much of it is experimental, which takes a large share of running and capital costs.

Atmosphere. As in former times the organization plays a large role as a meeting place for scientists from many

200 lbs. of accessories



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nations. For example, mainland Chinese have been among the physicists there. They have had a density of two per year for the past three years. The last delegates have just left and so far no replacements have been designated. The institute has also been the source of several joint Soviet-American papers.

We lunched there recently with Aage Bohr, son of Niels and the present director, sharing smørrebrød in the institute lunchroom. The atmosphere was informal and easy; visitors from Sweden and Poland joined us along with Torben Huus of the Van de Graaff group. Bohr, Huus and Jørgen Bøggild (high energy) form the three-man council that governs the organization.

1921 STAFF was, from left, standing, J. C. Jacobsen, S. Rosseland (Norway), Georg Hevesy (Hungary), H. M. Hansen, Niels Bohr; sitting, J. Franck (Germany), H. A. Kramers (Netherlands), B. Schultz, secretary.

The present institute has a permanent staff of 40 to 50 (depending on how you count), about 50 visiting scientists from about 18 nations and about 100 graduate students of the University of Copenhagen (of which it is a part).

Activities. Most visitors come with funds provided by their own countries. Some have scholarships from the International Atomic Energy Agency, the United Nations Scientific and Cultural Organization (UNESCO) and the North Atlantic Treaty Organization. Some are financed by the institute itself; for example, the Ford Foundation has provided $150 000 to be used for visitors in the next five years.

Another prominent bit of stimulus is from NORDITA (Nordic Institute for Theoretical Atomic Physics), the Danish, Finnish, Icelandic, Norwegian, Swedish organization, which supports four staff members and 10–15 visitors at the Bohr Institute each year. Two of the NORDITA staffers are Ben R. Mottelson, who is widely known among nuclear physicists as a colorful and stimulating person and who is now at work with Bohr on a book about nuclear structure, and Leon Rosenfeld (editor of the North-Holland journal *Nuclear Physics*).

About two-thirds of the institute activity goes to nuclear structure study and uses the institute Van de Graaff, its often rebuilt cyclotron, its tandem accelerator located near the Danish atomic energy laboratory at Risø and an Aldermaston (England) Van-de-Graaff – spectrometer combination. Other concerns are high energy (with work at CERN), general relativity (under Christian Møller) and many-body theory. Solid-state is not included because it is part of the program of another university department that combines work in chemistry, physics and mathematics. Bengt Strømgren, recently returned from the Institute for Advanced Study and now holding a chair in astrophysics at Copenhagen University, is joining the activities.

History. Niels Bohr became a Copenhagen professor in 1916 and, with the help of the Carlsberg Foundation (which still contributes), many individual Danes and the Danish government, founded the institute. Its first building was completed in 1921. For years the organization was a meeting place, and a list of visitors who have spent significant periods of study there includes such great names as Lise Meitner, Léon Brillouin, Werner Heisenberg, Georg Hevesy, Edward Teller, Homi Bhabha, Bruno Rossi, H. A. Kramers (Niels Bohr's first assistant in Copenhagen), Felix Bloch, Paul Dirac, Nevill Mott, R. Bruce Lindsay, Harold Urey, Lev Landau. The original building is now one of ten; the population is about 30 times the eight persons (including secretary) who posed for a picture in 1921.

Amid the distractions of easy communication and rapidly moving persons, it is not easy to maintain the old atmosphere when everyone around learned to talk Danish in his work. But many alumni return frequently, and the residents make a desperate effort to defend the old customs. One hopes that they will always be successful. —RHE

High Isobaric Spin States Are Found in Light Nuclei

Nuclear physicists are enthusiastically exploiting their new ability to observe states whose isobaric spins are higher by one or two units than the ground state in light nuclei. During the past few years experimenters have located the lower $T = 3/2$ (where low-lying states are $1/2$) and $T = 2$ (where low lying states are 0) states in most of the light nuclei. Since excited states are