

movich reported on the outstanding properties and the high electron temperatures of the plasmas which had been obtained in the Tokamak devices. However, the adopted diagnostic methods, on the basis on which his report was based, were deemed too crude by most of his Western colleagues and Artsimovich's message was not accepted. Yet when some of us had the opportunity to spend time at his Institute in 1967 and to discuss all the pieces of information that had been put together to identify the plasma regimes that were achieved in the T-3 and TM-3 Tokamaks, it became apparent that Artsimovich's report had a solid foundation. In spite of this the atmosphere of skepticism on the Tokamak results was not completely dispelled (We still remember some his days of discouragement during his stay with us at MIT in early 1969.) even up to the time of the Dubna Conference in November 1969, when an independent set of measurements obtained at the Kurchatov Institute by a British team revealed that the plasma parameters achieved in the T-3 Tokamak device were even better than those claimed by Artsimovich and his colleagues.

At the time of his death he was working on improvements, both in the method of plasma heating and in the magnetic configuration shape, that he hoped would eventually succeed in bridging the final factor of 10 in ion temperature separating the existing Tokamaks from the level required for thermonuclear power production. Although Artsimovich was certain that the conditions for controlled thermonuclear reactions could be attained in the laboratory, he nevertheless was equally certain that its practical application would not happen in his lifetime—that this was still 10–20 years away—because the solution of a problem of such great technological difficulty could not be achieved without a better understanding of the basic physics of all the processes involved.

But his interests in science far transcended the field of plasma physics. He was a major driving force in the Soviet Academy in support of fundamental research, especially in various branches of modern astronomy and astrophysics, believing that only through deep and effective involvement in such frontier fields would Soviet science be able to achieve a position in the forefront of modern world science. He was a conscientious and devoted teacher, as proud of the popularity of his courses in plasma physics and ion optics as of his scientific achievements. As a science administrator he fought a vigorous and continuing battle to break down the traditional system of control over science by the authoritarian "herr Professor," insisting on mandatory

early retirement of laboratory heads and the establishment of direct mechanisms for bringing young scientists into positions of authority as early as possible.

Lev Artsimovich was a gentle man, but with a sharp, acerbic wit that could not tolerate fools. He believed in the future, despite a short-range pessimism that was easily mistaken for cynicism on first encounter. He was a loyal citizen of his country, but believed that it could learn a great deal from the rest of the world. He worked for open international intercourse of all kinds, not only because he believed that international cooperation is good for science, but also because he believed that increased international exchanges tend to make the world a safer place, and finally because he could not conceive that others would not enjoy travel and variety as much as he did.

Artsimovich's role as Soviet scientist, Academician and member of the Russian intelligentsia was a seminal one. He made major contributions to the postwar development of Russian science and to its evolution in the direction of greater openness and more freedom.

He was among the best known of contemporary Russian scientists, not only for his scientific work but also as a personal friend of the large numbers of colleagues who met him at scientific and Pugwash conferences. Lev Artsimovich leaves behind a host of friends and admirers in the West as well as in the Soviet Union.

BRUNO COPPI
BERNARD T. FELD

*Department of Physics
Massachusetts Institute of Technology*

Burton Jones Moyer

Burton Jones Moyer, professor of physics at the University of California in Berkeley (1947–71) and Dean of the College of Liberal Arts at the University of Oregon (1971–73) died in Eugene, Oregon on 21 April. He was known and respected by high-energy physicists and health physicists the world over.

Moyer was born in 1912 in Greenville, Illinois, where his father was professor of chemistry at Greenville College, a small denominational institution. He did undergraduate work and received his AB at Seattle Pacific College, where his father was then Dean. He completed his PhD in physics at the University of Washington in Seattle in 1939. He was greatly influenced by his parents, both deeply religious persons. The guiding motive of his life was service, service to his fellow men

New Books from North-Holland

Crystal Growth An Introduction

Edited by **P. HARTMAN**, Rijksuniversiteit, Leiden, The Netherlands

(North-Holland Series in Crystal Growth, Vol. 1)

The book is primarily intended for anyone entering the field of crystal growth research or for those who have to deal with crystal growth problems in various branches of science, such as solid state physics and chemistry, materials science, metallurgy, ceramics, chemical engineering, crystallography and mineralogy.

CONTENTS: Nucleation and Epitaxy. Techniques of Crystal Growth. Theory of Crystal Growth. The Properties and Observation of Dislocations. 1973. approx. 525 pp., \$23.50

Computed Electron Micrographs and Defect Identification

By **A. K. HEAD, P. HUMBLE, L. M. CLAREBROUGH, A. J. MORTON** and **C. T. FORWOOD**, CSIRO-Division of Tribophysics, University of Melbourne, Australia

(Defects in Crystalline Solids, Vol. 7)

CONTENTS: Introduction to the basic theory. Experimental techniques. Principles of ONEDIS. Matching with ONEDIS. Principles of TWODIS. Matching with TWODIS. Application of the technique. Discussion of the applications and limitations of the technique. Computer programs. 1973, approx. 400 pp., \$35.00

Quantum Mechanics New Approaches to Selected Topics

By **H. J. LIPKIN**, Weizmann Institute of Science, Rehovoth, Israel

CONTENTS: Polarized photons and quantum theory. The Mossbauer effect. The Mossbauer effect in a solid. The Mossbauer effect and momentum transfer to bound systems. Identical particles and second quantization. Identical composite particles and bound systems. Kaon decay. One-dimensional scattering in quantum mechanics. The many-body problem in quantum mechanics. Pairing correlation and the BCS theory. Elementary excitations in many-body systems. Feynman diagrams, propagators and fields. Introduction to relativistic quantum mechanics. Invariance, symmetry transformations and conservation laws. The Lorentz group. 1973, approx. 475 pp., \$36.75

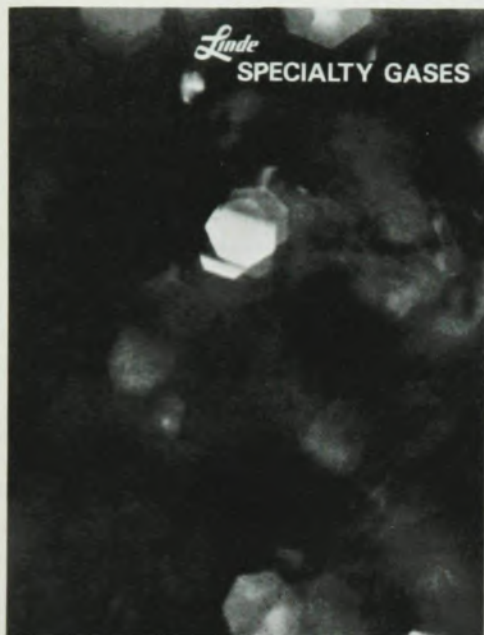
*Distributed in the United States
and Canada by*

**American Elsevier
Publishing Company, Inc.**

52 Vanderbilt Avenue
New York, N.Y. 10017

Circle No. 31 on Reader Service Card

NOW, SOMETHING EXTRA IN SPECIALTY GASES.



FREE.
Linde's new
108-page
catalog.
The most
comprehensive
in the
industry.

Oh sure, we've always made more specialty gases than anyone else.

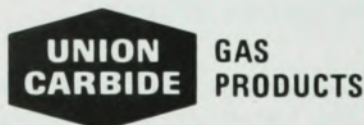
After all, Linde is a Division of Union Carbide, a corporation that's been making industrial gases for over 50 years.

But for the first time we combined the gases and the equipment and cataloged it all for you. Color-coded the sections, so you quickly get what you want.

And we *supply* what you want quickly too. Five hundred Linde Distributor locations nationwide provide fast service, but we mean really *fast* service. Cost-cutting FOB delivery too, because we have 5 plants across the country.

Linde's product know-how can even help you pinpoint your needs. Not just in specialty gases and types of containers, but in control equipment too.

They're all there in our new catalog. Our little something extra to help make your job easier. Send for your free copy today.



Linde is a registered trademark of Union Carbide Corporation

UNION CARBIDE CORPORATION
LINDE DIVISION, Dept. LB—PT6
270 Park Avenue
New York, New York 10017

Gentlemen:

Please send me "the something extra" in specialty gases.

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

Circle No. 32 on Reader Service Card

obituaries

everywhere, in every form, as dictated by his religious and ethical principles.

After receiving his PhD, he returned to Greenville College as professor of physics. In June 1942 he came to Berkeley to work on the separation of uranium isotopes under Ernest Lawrence. He quickly became a group leader and spent considerable time in Oak Ridge, Tennessee, in the operation of the electromagnetic separation plant. At the close of the war he returned to the Radiation Laboratory in Berkeley, first to nuclear physics experiments using separated isotopes,



MOYER

then to high energy physics. Simultaneously he started teaching in the physics department as lecturer, was appointed associate professor in 1950 and professor in 1954. By this time a series of papers had established him as one of the world's leading high-energy physicists. Perhaps the best known paper, written with Bjorklund, Crandall and H. F. York, appeared in 1950 under the modest title, "High Energy Photons from Proton Nucleon Collisions," announcing the discovery of the neutral pi meson. This was a milestone in particle physics. It was followed by several papers on the neutral pion and others of great interest such as "Nucleon Momentum Distributions in D and C Inferred from Proton Scattering" and "Comparison of the Reactions $p + d \rightarrow H^3 + \pi^+$, $p + d \rightarrow He^3 + \pi^0$ as a Test of Charge Independence," a classic paper. Moyer's style was clearly discernible; it was characterized by precision, thoroughness and expert analysis.

In addition to his work in nuclear

and particle physics, Moyer directed the Health Physics activities in Berkeley from 1947 to 1970. His leadership and wisdom led in large measure to present understanding of radiation protection problems associated with particle accelerators. For example, he developed a method for estimating the shielding thickness required for accelerators that is straightforward and uncomplicated, yet full of insight.

He directed the thesis research of 62 students. Together they generated a steady and important stream of high-energy physics papers. Moyer attended numerous conferences and was a rapporteur on several occasions. In 1962, at the urging of his colleagues, he accepted the chairmanship of the physics department at Berkeley. He became a trusted and admired chairman, able to meet with understanding and success the troubling problems of student unrest beginning in 1964.

Both before and after World War II Moyer had wanted to spend time in missionary work in China. Events had prevented this, but in 1965 he accepted an opportunity for a different kind of service, a position at the India Institute of Technology at Kanpur. He spent the year teaching physics, aiding the research program and helping to create a viable technical school. He left a lasting impression there. In 1968 Moyer retired from the chairmanship and returned to his research group, to teaching and to some important committee assignments on the Berkeley campus as well as to work with NSF and AEC. He undertook the revision of *Vol. I, Mechanics*, of the Berkeley Physics Course with A. C. Helmholz. He felt then that research in high-energy physics should pass to younger physicists. In view of this and his desire to serve, it was not surprising that he accepted the position of Dean of the College of Liberal Arts at the University of Oregon.

During his two years and three months of service as Dean, he suffered through the worst budgetary crisis known at the College and University. However, he exhibited the highest degree of fortitude, spirit, and good humor, quickly gaining the faculty's respect for his sound academic judgment, fairmindedness and firmness. Moyer combined the best of scientific and humanistic traditions by using his scientific training and clear thinking for humane ends. He was loved and admired by students and colleagues alike as a man of generous and serene good will and absolute integrity.

E. SEGRÈ

E. D. COMMINS

A. C. HELMHOLZ

Department of Physics

University of California, Berkeley □

95 KILOGAUSS

°Kryoconductor[®] Nb Ti

SUPERCONDUCTING

MAGNET

at 2.2° K

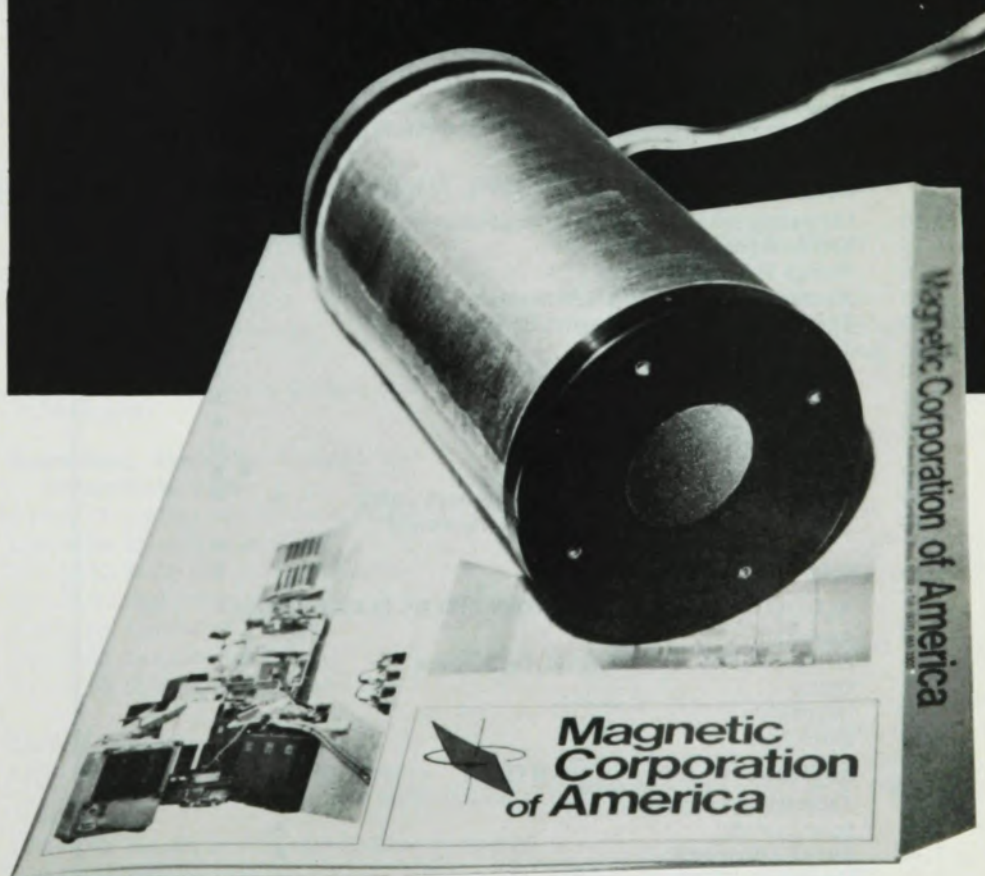
77 kilogauss @ 4.2 K

0.02% uniformity 1 cm d.s.v.

1.50 inch diameter bore

- superconducting magnets
- systems • Kryoconductor[®]
- standard magnets

Call or write,
Small Magnet Systems Dept.
for further information.



An
Equal
Opportunity
Employer

179 Bear Hill Road
Waltham, Massachusetts 02154

617-890-4242

Circle No. 33 on Reader Service Card