

have demonstrated unusual accomplishments in new and developing fields of technology.

Nicholas P. Samios, who has been Chairman of the Physics Department at Brookhaven National Laboratory, has become the first Deputy Director for High Energy and Nuclear Physics at the Lab. Among his responsibilities will be planning for the scientific programs at the ISABELLE accelerator. **Martin Blume** has assumed the new position of Associate Director for Low Energy Physics and Chemistry at BNL. Former head of the Synchrotron Radiation Scientific Program at BNL, he will oversee the new National Synchrotron Light Source.

James A. Van Allen, head of the department and professor of physics and astronomy at the University of Iowa, has been appointed a regent's fellow of the Smithsonian Institution. He will write

a monograph on the origins of magnetospheric physics.

Steven M. Grimes, formerly of the Lawrence Livermore Laboratory, has been appointed professor of physics at Ohio University.

Ralph P. Hudson has become editor of the journal *Metrologia*. He was previously Deputy Director for the Center for Absolute Physical Quantities at the National Bureau of Standards.

Freeman J. Dyson, who is professor of physics at the Institute for Advanced Study, delivered the 1981 Paul E. Klopsteg Lecture at Northwestern University, "For Science's Sake: Public Support of Astronomy."

Morrel Cohen, professor of physics at the University of Chicago, is going to be senior scientific adviser at the Exxon Research and Development Center in Linden, NJ.

obituaries

Max Delbrück

Max Delbrück, one of the most influential physicist-biologists of our time, died in Pasadena, California on 9 March 1981.

The basis for Delbrück's influence and widely revered status is not easy to explain since he did not make any of the kinds of spectacular breakthroughs with which the names of very great

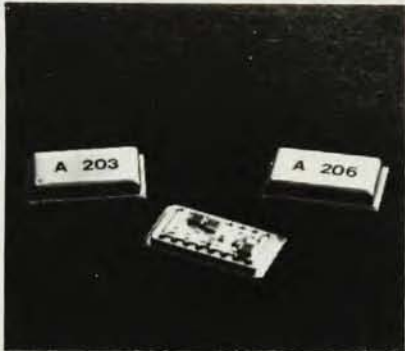
scientists are normally associated. Rather, from the mid-1930s to the mid-1950s, by dint of his tremendous intellect, far-ranging vision and charisma, he provided the ideological and spiritual fountainhead for the discipline that would eventually call itself molecular biology.

Delbrück was born in Berlin in 1906. He studied physics in Göttingen, from 1926 to 1929, at the time of the



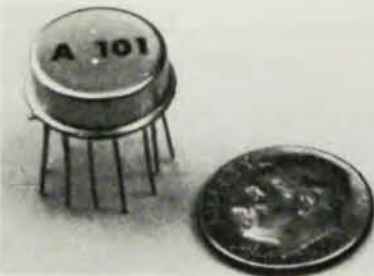
Some of the members of the Phage Group, a circle of molecular biologists informally guided by Delbrück, lunching at Caltech in 1949. Present, from left to right, are Jean Weigle, Ole Aaloe, Elie Wolman, Gunther Stent, Delbrück and Giorgio Soli, in a Black Star photo by Ross Madden.

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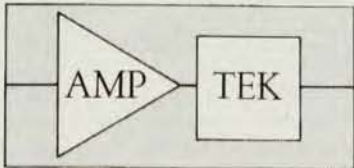
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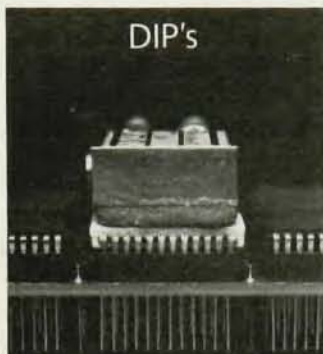
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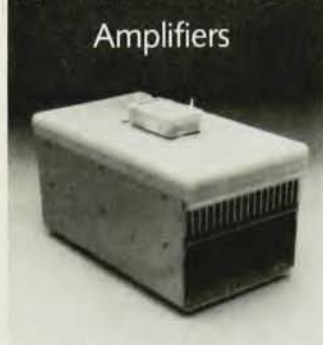
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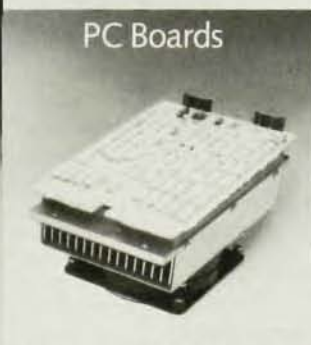
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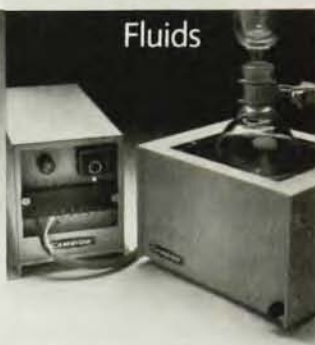
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excitement generated by the development of quantum mechanics. In his second Göttingen year, Delbrück published a paper in which he provided formal mathematical proofs for a theorem that Eugene Wigner, then also at Göttingen, had used in his first application of group theory to theoretical physics. With that paper, Delbrück attracted the attention of Walter Heitler and Max Born. Born offered Delbrück a teaching assistantship, and Heitler proposed to him as a PhD thesis topic a quantum mechanical calculation of the strength of the Li-Li bond. After obtaining his PhD, in 1930, Delbrück went to Copenhagen as a post-doctoral fellow in Niels Bohr's laboratory.

In 1932 Delbrück became assistant (and house theoretician) to Otto Hahn and Lise Meitner at the Kaiser Wilhelm Institute for Chemistry in Berlin. In that capacity he published an addendum to a paper by Meitner and H. Koster in which he attributed their finding of coherent scattering of hard gamma rays to the polarization of the vacuum by the nucleus, in accord with Dirac's theory of holes. This proposal was theoretically sound, but turned out to be inapplicable to the case to which Delbrück had applied it. However, in the 1950s Hans Bethe eventually demonstrated the existence of the phenomenon and named it "Delbrück scattering." Another seminal paper published by Delbrück (in collaboration with Gert Molière) at that time presented an attempt to resolve the paradox of irreversibility in classical statistical mechanics, by resorting to the quantum mechanical uncertainty principle.

In later years, Delbrück thought he had failed his task as the Institute's theoretician because he had not recognized at once that Hahn and Meitner were inducing atomic fission by their neutron irradiation of uranium. One possible reason for his failure is that by then Delbrück's interest had already turned to biology, mainly as a result of having heard Bohr's famous 1932 lecture "Light and Life." In that lecture, Bohr first outlined the general epistemological consequences of the Copenhagen complementarity interpretation for scientific domains other than physics, especially for biology. In particular, Bohr thought that, for the ultimate understanding of life itself, some fundamental complementarity relation holding for living aggregates of matter must first be found, and that this finding would devolve from the discovery of some deep paradox presented by life. Delbrück published a paper in 1935 in which he pointed out that genetics is that domain of biology in which Bohr's anticipated complementarity relation is most likely to be found, because the

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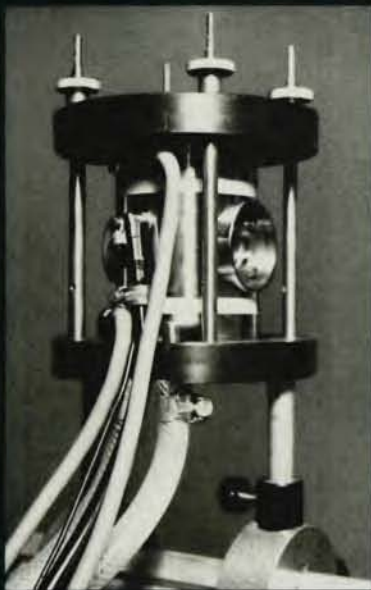
long-term stability of the tiny gene bids fair to embody a deep paradox.

In 1938, Delbrück decided to give up theoretical physics and do full-time work in genetics at Caltech. There he began to work on bacterial viruses, realizing that they are the ideal experimental material for studying self-replication since the evident capacity for self-replication seemed the most mysterious and, possibly, the most paradoxical aspect of the gene. Upon the outbreak of World War II, Delbrück did not return to Germany. Instead, he moved from Caltech to Vanderbilt University, where he served as instructor of physics until 1947 (without ever receiving any promotion beyond this lowest of faculty ranks). In 1940, at a meeting of the American Physical Society, Delbrück happened to meet Salvador Luria, then recently arrived in America as a refugee from war-torn Europe. Delbrück and Luria found that they were both interested in the same fundamental problem. Just as the birth of genetics is considered to have taken place in 1865 upon the appearance of Gregor Mendel's paper reporting the conclusions he had drawn from his crosses of the garden pea, so the birth of bacterial genetics can be assigned to 1943, when Luria and Delbrück published a paper in which they showed that the appearance of virus-resistant variants in cultures of virus-sensitive bacteria represents the selection of spontaneous bacterial mutants. Luria and Delbrück were not the first to study bacterial mutation, any more than Mendel, another ex-physicist, was the first to cross plants for the study of heredity. But with their paper Luria and Delbrück did for bacterial genetics what Mendel had done for general genetics—namely, showed for the first time what kind of experimental arrangements, what kind of data analysis, and, above all, what kind of sophistication is needed for obtaining meaningful and unambiguous results. Their paper became the standard by which all later papers were to be measured. Soon thereafter Delbrück (and Alfred Hershey) discovered the existence of genetic recombination in viruses, a process which had been previously thought to be reserved for more evolved, sexually reproducing forms of life. These findings gave the start for virus genetics, whose ultimate refinement by yet another physicist-biologist, Seymour Benzer, a few years later led to reform of the classical concept of the gene.

In 1947, Delbrück returned to Pasadena, as professor of biology. His laboratory at Caltech became the focal point of what was later to be called the "informational school" of molecular biology. Luria's student, James Watson,

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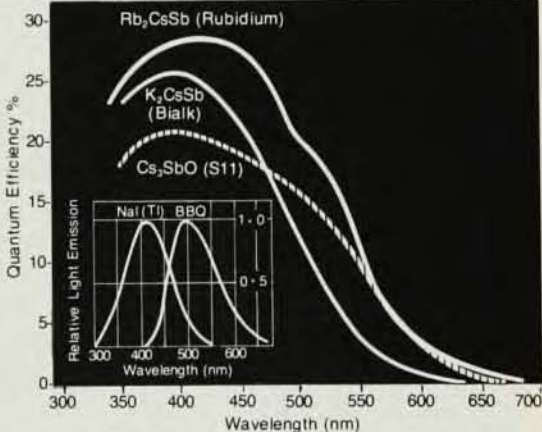
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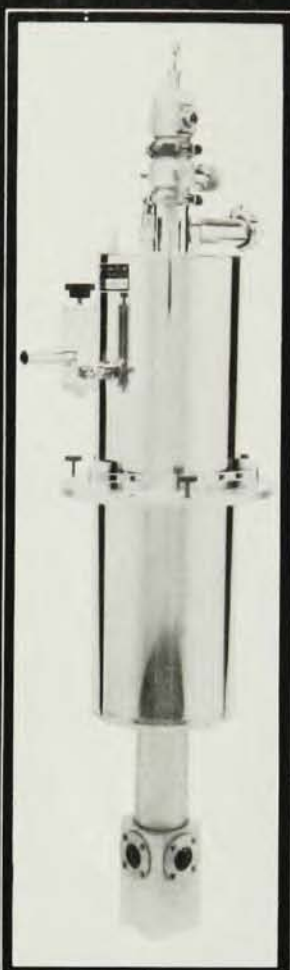
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one of the disciples of that school, made his first written communication of his and Francis Crick's discovery of the DNA double helix in 1953 in a letter to Delbrück. In recognition of their central role in transforming the landscape of classical Mendelian genetics into the molecular Crick-Watsonian scene, Delbrück, Luria and Hershey shared the 1969 Nobel Prize for Physiology or Medicine.

In the last few years before his retirement from active teaching at Caltech, Delbrück taught an annual course on the philosophy of science. In this course, Delbrück developed further the epistemological ideas embodied in Bohr's "Copenhagen spirit," particularly those most profound questions about the relation of human rationality to reality. In retrospect it seems that Delbrück's greatest contribution was to have been a kind of Gandhi of biology who, without possessing any temporal power at all, was an ever-present and sometimes irksome spiritual force. "What will Max think of it?" was the central question for the molecular biological psyche.

GUNTHER S. STENT
University of California
Berkeley

Luise Meyer-Schützmeister

Luise Meyer-Schützmeister, senior physicist in the Physics Division of Argonne National Laboratory, died after a brief illness, on 19 January 1981. She had been active in experimental research in nuclear physics, particularly in the investigation of giant resonances.

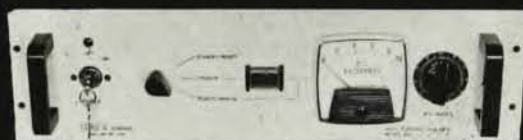
Meyer-Schützmeister was born in Magdeburg, Germany. She did her undergraduate work in Berlin, started her graduate studies with Walter Gerlach at the University of Munich, later moved to the Technical University of Berlin, where she received her PhD in 1943 for work under Hans Geiger. After the war she worked briefly at the University of Göttingen before taking charge of the Radioisotope Laboratory of the new Max Planck Institute for Medical Research. This laboratory, which she organized, became the distribution center for radioisotopes for medical and industrial use in Germany.

In 1952 Meyer-Schützmeister and her husband, physicist Peter Meyer, emigrated to the United States. At the Institute for Nuclear Studies at the University of Chicago she worked with Valentin L. Telegdi on photonuclear measurements at the betatron. In 1956 she joined the Physics Division at Argonne National Laboratory. There she remained for the rest of her career.

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