Probe of the universe." Pawel O. Mazur (Syracuse University) received the third prize of $200 for "Are there topological black hole solitons in string theory?" Yong-Shi Wu (University of Utah) and Zi Wang (Utah State University) received the fourth prize of $150 for "Present time variation of Newton's gravitational constant in superstring theories." Amos Ori (Racah Institute of Physics, Israel) and Tsvi Piran (Racah Institute and the Institute for Advanced Study, Princeton) received the fifth prize of $100 for "Self-similar spherical gravitational collapse and the cosmic censorship hypothesis."

in brief

Dan Baker, a physicist at Los Alamos National Laboratory, in June became head of the Laboratory for Extraterrestrial Physics at the NASA Goddard Space Flight Center in Greenbelt, Maryland.

John Fabian, a former space shuttle astronaut and director of space at the US Air Force Headquarters, in July became vice president for space systems at ANSER (Crystal City, Virginia).

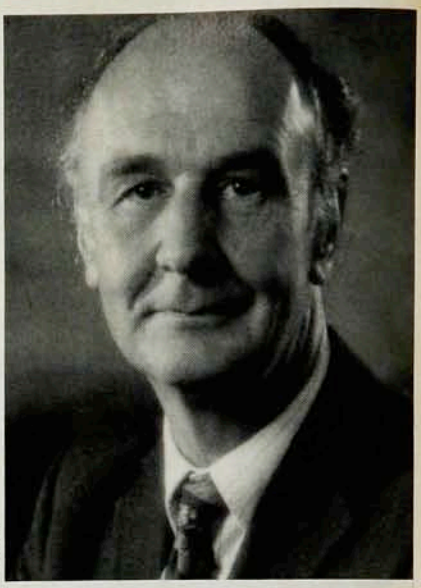
Neil Stein, formerly director of research and development at Spex Inc. (Edison, New Jersey), has become vice president of operations at Instruments SA Inc. (also in Edison).

obituaries

Paul Matthews

Paul Taunton Matthews, who made major original contributions to meson theory and who served in policy advisory positions to Great Britain's Science Research Council and CERN, died on 26 February, a few days after he was struck by a truck while riding his bicycle in Cambridge, England. He was on his way at the time to check some facts for the collected writings of Paul A. M. Dirac, which he was editing. Matthews was 67 years old.

Born in Broda, India, the son of a clergyman who was professor of English at the Madras Christian College, Matthews came to England at the age of six and was educated at Mill Hill School and Clare College, Cambridge, where, in 1940, he received a first-class honors degree in mathematics. During the war he served in China with the Friends' Ambulance Unit distributing



ARGENT

MATTHEWS

medical supplies to the Chinese National Medical Service and to mission hospitals. At the war's end he returned to Cambridge to do research in mathematical physics.

In September 1950 he went for a year to the Institute for Advanced Study at Princeton, where he contributed to different aspects of particle physics and quantum field theory. He returned to Cambridge for a year as an Imperial Chemical Industries research fellow before going to Birmingham University, where he lectured for the next five years. He went back briefly to the US as visiting professor at the University of Rochester, returning to Britain as reader in theoretical physics at Imperial College. His standing as an international expert in quantum field theory was recognized with his appointment in 1962 to a chair at Imperial College, which he held until 1976.

His *Quantum Mechanics* was published in 1963 and that year he was elected as a fellow of the Royal Society. While department head at Imperial College, Matthews helped shape science policies in both Great Britain and Europe. Between 1972 and 1975 he was dean of the Royal College of Science (1972–75), a member of Britain's Science Research Council (1972–74) and at the same time chairman of the SRC's nuclear physics board and a member of the CERN scientific policy committee.

Matthews's energy and enthusiasm were unbounded. During this period he wrote his second book, *The Nuclear Apple*. In 1976 he received the coveted Rutherford Medal for his contributions to elementary-particle physics, and the following year he accepted the vice chancellorship of Bath University. He arrived at Bath determined to raise

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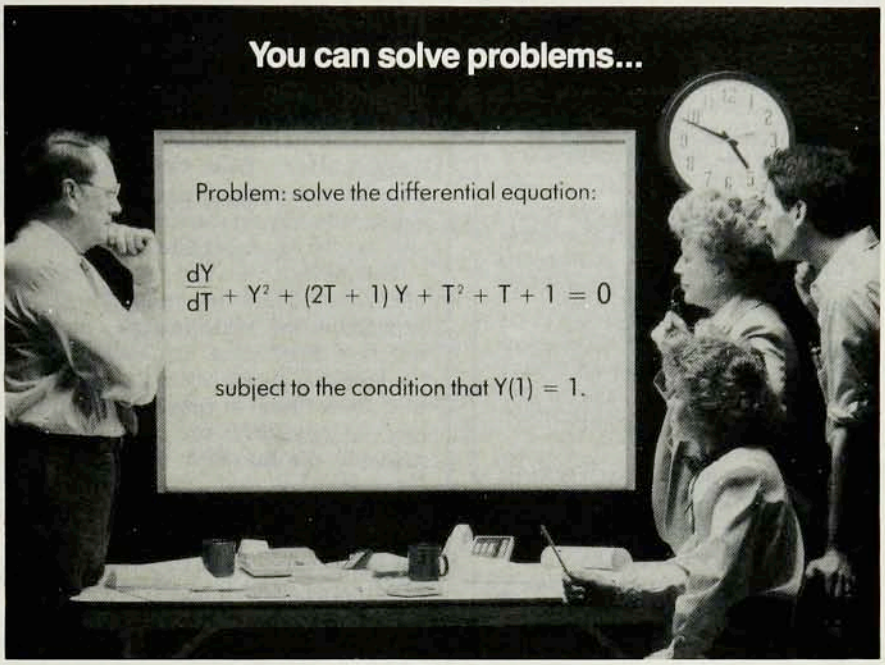

Symbolically...

```
(C1) DEPENDS(Y,T)$
(C2) DIFF(Y,T)+Y^2+(2*T+1)*Y+T^2+T+1;
```

$$(D2) \quad \frac{dY}{dT} + Y^2 + (2T+1)Y + T^2 + T + 1$$

```
(C3) SOLN:ODE(D2,Y,T);
```

$$(D3) \quad Y = -\frac{\%C\,T\,\%E^T - T - 1}{\%C\,\%E^T - 1}$$

```
(C4) SOLVE(SUBST([Y=1,T=1],D3),%C),NUMER;
(D4)     [%C = 0.5518192]
(C5) SPECIFIC.SOLN:SUBST(D4,SOLN);
```

$$(D5) \quad Y = -\frac{0.5518192\,T\,\%E^T - T - 1}{0.5518192\,\%E^T - 1}$$

and Numerically.

```
(C6) FORTRAN(D5)$
        Y = -(0.5518192*T*EXP(T)-T-1)
     1        /(0.5518192*EXP(T)-1)
```

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teaching standards, but he was told to expect a cut in the university's budget and was compelled to stop hiring any more faculty or staff. Despite such limitations, Bath fared considerably better during the period of Matthews's leadership than many other academic institutions. While undergraduate intake remained static, the number of doctorates awarded by Bath increased considerably.

On his retirement in 1983, Matthews returned to Cambridge to teach. His advice on policy matters was eagerly sought after. That year he was appointed chairman of the government's select advisory committee on radioactive waste management.

Matthews never lost touch with students, to whom he was always approachable and stimulating. I met him for the first time in 1950 at the Cavendish Laboratory in Cambridge. I had gone there to request Nick Kemmer to take me on as a research student. In my first interview with Kemmer, he said: "All theoretical problems in quantum electrodynamics have already been solved by Tomonaga, Schwinger, Feynman and Dyson. Paul Matthews has done nearly the same for meson theories. He is finishing his PhD this year. Ask him if he has any problems left."

With characteristic generosity Matthews suggested the problem of renormalizing spin-zero mesons to all orders. He told me to work on it "till I get to work in the fall. If you don't solve it by then, I'll take it back."

During the few months that Matthews was still in Cambridge before his holiday I had daily contact with him. He provided me with intellectual as well as physical sustenance. This was just after the war, when Britain was in the throes of severe austerity, and to find a table at which Paul and his wife, Manzi, offered kosher sausages and other delights that defied the rationing allocations was for me the epitome of bliss.

I joined Matthews as a colleague in early 1951 at the Institute for Advanced Study, where we began a collaboration that continued over the next 14 years. He returned to Cambridge and acted as examiner for my PhD. We subsequently worked together on a field-theoretic formulation of Richard Feynman's path integrals. After I joined Imperial College in 1957, Matthews followed. We worked together on dispersion relations and on unitary symmetries.

I came to admire him more and more for his physics and his humanity. His clarity of thought and exposition were legendary among physicists and students. Imperial's undergraduates voted him best lecturer in physics year after year. His own insistence on excellence continued unblemished when, later, as vice chancellor at Bath, he was recognized by Britain's University Grants Commission for transforming the place into one of the country's model universities. With his untimely death, Britain and the physics world have lost a collegial giant and a prince among men, and I, one of the dearest of personal friends.

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London, England

George H. Vineyard

George H. Vineyard, director of Brookhaven National Laboratory from 1973 through 1981 and president-elect of The American Physical Society, died of cancer on 21 February 1987. He was 66 years old.

Vineyard's distinguished career centered on basic research in theoretical solid-state physics. In addition, he held many administrative positions at Brookhaven, culminating in his appointment as the laboratory's fourth director. He resigned to return to full-time research, remaining active even during his illness.

Born in St. Joseph, Missouri, in 1920, Vineyard studied physics at MIT, receiving his BS degree in 1941, and his PhD in 1943 with a thesis on the behavior of space charge in the cavity magnetron. From 1943 to 1946 he was on the staff of the MIT Radiation Laboratory, working on microwave electronics and radar.

VINEYARD