

Landau and Vladimir Fok and the mathematician Nikolai Luzin.

The letters in this volume also throw light into some obscure corners of Kapitsa's career that have puzzled many in the West. Did Kapitsa return to the USSR of his own free will? His letter to Molotov of 7 May 1935 shows that he was, in fact, detained, as mentioned above. Did Kapitsa refuse to participate in the A-bomb project because he was a pacifist? No. According to his letter to Stalin of 25 November 1945 he chose not to participate because he did not have much confidence in the success of the enterprise and had had a run-in with Beria, the czar of Soviet nuclear research. Did Kapitsa participate in military-related research? Yes. As a letter to Georgi Malenkov dated 25 June 1950 attests, he developed one of the first blueprints of what we would now call a "Star Wars" system.

Kapitsa's loyalty to the regime gave him additional opportunities to try to reform it from within. In the last letter in this remarkable collection, written in 1980, Kapitsa wrote to Andropov, then head of the KGB, in defense of Soviet dissidents Andrei Sakharov and Yuri Orlov. "We achieved nothing applying growing administrative pressure to Sakharov and Orlov. [Sakharov had already been sent into exile in Gorki and Orlov was in jail.] Maybe it's better, plainly speaking, just to backpedal?" Thus Kapitsa was able to help the transition from Stalin's totalitarianism to Mikhail Gorbachev's *perestroika*: not a small accomplishment. Though incomplete (at least one letter to Stalin is missing), this remarkable collection certainly merits translation into English.

## Letters to Mother: The Early Cambridge Period

**P. L. Kapitsa (edited by D. Lockwood; translated by E. Lockwood)**

*National Research Council of Canada, Ottawa, 1989. 120 pp.  
\$10.50 pb ISBN 0-660-13099-8*

Now that the political climate is changing in the Soviet Union, we can expect to learn a great deal about Soviet physics in the 20th century that has heretofore been obscure. High on the list of interesting topics is the career of Peter Kapitsa. Since the preceding review by Mark Kuchment outlines Kapitsa's career, it is unnecessary to repeat that material here. Like the book reviewed by Kuchment,

this is a collection of letters, but in this case they have been translated for us (by Eugenia Lockwood). The book reproduces the complete text of the letters from Kapitsa to his mother published in the Soviet magazine *Novy Mir* in 1986, and includes an introduction by Academician Yuli Khariton as well as many footnotes by Pavel E. Rubinin.

As editor David Lockwood's writes in his preface:

These letters make fascinating reading even today, more than six decades after they were written. They give a lively account of Cambridge life in the 1920s as seen by a young Russian visitor. They also indicate the difficulties, stress and loneliness he faced in coming to work in a foreign land, particularly after the devastating personal tragedy of losing his father, his young wife and two children just months before his arrival in Cambridge. They reveal [Ernest] Rutherford's immense influence on the young Kapitsa, whose Cavendish experience set the tone for his future research work and his attitude toward science, in general. Through these letters we also follow the evolution of a most rewarding and affectionate relationship between Kapitsa and Rutherford. The oft-mentioned nickname of 'Crocodile' given to Rutherford by Kapitsa first appears in this collection in the letter dated 25 October 1921 and is used extensively by Kapitsa thereafter. The meaning behind it has been variously interpreted as being due to Rutherford's loud voice or heavy tread, and references are often made in English experience to the crocodile in *Peter Pan* and in Russian experience to the crocodile poems by K. I. Chukovsky. In the tradition of Russian usage, however, the term 'crocodile' when applied to people conveys the connotation of awesomeness that certainly dominated the young Kapitsa's attitude to Rutherford during their initial encounters. The exact reason for Kapitsa's use of the term is difficult to ascertain, as he was quite equivocal about it. Kapitsa earned for himself the nickname 'Centaur,' which was as ambiguous as his own nickname for Rutherford.

Khariton's introduction, which traces Kapitsa's career through the period 1921-26, is itself a very interesting and useful document. The book also contains 11 photographs

portraying the apparatus and surroundings at the Cavendish Laboratory in the 1920s.

Physics at Cambridge had during that time reached a pinnacle that has seldom been achieved anywhere. Typical of Kapitsa's insights into British science is the following passage:

It was England, however, that produced the greatest physicists, and now I begin to understand why. The English school is exceedingly conducive to the development of individuality and provides infinite opportunities for self-expression. One of its main characteristics is the absence of routine and stereotype.... The second factor is the drive to obtain results. Rutherford is very concerned that a person would not work without seeing some results, for he knows that this may kill one's desire to work.

Several letters also describe the construction and testing of the large generator Kapitsa used to create high impulsive magnetic fields. The letters also reveal British society in the 1920s as seen from Cambridge University by a clever and sensitive Soviet citizen. Some of the letters describing social occasions are hilarious, in particular, the account of James Chadwick's wedding and Kapitsa's first airplane flight.

Anyone interested in the evolution of physics in the first half of this century would be well advised to read this small volume. It is scrupulously translated, annotated and edited—a permanent contribution to the history of physics.

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## China Builds the Bomb

**John Wilson Lewis  
and Xue Litai**

*Stanford U. P., Stanford,  
Calif., 1988. 329 pp.*

*\$29.50 hc ISBN 0-8047-1452-5*

With the publication of *China Builds the Bomb* by John Lewis and Xue Litai, we now have on record, in varying degrees of detail and authoritativeness, studies on each of the five acknowledged nuclear weapon states. The authors examine the why and the how of Chinese entry into the "nuclear club." By doing so they provide insight into the international and foreign policy considerations that motivated China's decision. They also reveal how a backward nation confronting enormous economic development problems and a lack of assets necessary to move a high-technology