

to work on proteins, other X-ray work was carried out on a variety of practical problems, the structure of fuel ash, and the hardening of cement, for example. He developed his interest in water, using model building methods in an attempt to understand its structure. At the same time a major part of his energies now involved general biological problems as can be seen in at least two major books, *The Physical Basis of Life* (1950) and *The Origin of Life* (1967).

While Bernal did not follow up many of his best ideas, leaving this to others, none the less his own published scientific work was of absolutely major importance. This was recognized in the many scientific honours he received. He was elected a Fellow of the Royal Society in 1937, and in 1945 he was awarded the Royal Medal of the Royal Society. His high standing in the crystallographic community is reflected by the fact that he was President of the International Union of Crystallography from 1963 to 1966.

Bernal's self-definition as a scientist was exceptionally broad, because it explicitly encompassed ethical and political concerns. In 1923 he joined the Communist Party of Great Britain, with which he was closely associated throughout his life. The period of his most active involvement with politics dates, however, from the early thirties. From then until the outbreak of the Second World War, he helped spearhead a movement of young radical scientists through such organizations as the Cambridge Scientists' Anti-War Group and the Association of Scientific Workers. He was also a prominent participant in the early work of the British Association's Division for the Social and International Relations of Science (founded in 1938). Internationally, Bernal's friendships with socialist researchers in France and the

Soviet Union were instrumental in the foundation of the World Federation of Scientific Workers in 1946. As befitted the breadth of his intellectual interests, the "two cultures" phenomenon hardly affected Bernal, who numbered among his close acquaintances such non-scientists as Benjamin Farrington, Barbara Hepworth, Henry Moore and John Strachey.

Bernal was a thoroughgoing Marxist. His social philosophy, the product of a lifelong dialectic between his ideological beliefs and his professional experiences, was that of scientific socialism. From that vantage point—best summed up in *The Freedom of Necessity* (1949)—he boldly surveyed man's past in *Science in History* (3rd ed., 1965) and his possible future in *The World, the Flesh and the Devil* (1929). But the best-known of his works was *The Social Function of Science* (1939), a prophetic indictment of the non-use or mis-use of scientific resources in capitalist societies.

In an age of ceaseless warfare, Bernal was above all a partisan of peace. Not being a pacifist himself, his anti-war stance was subjected to the political vagaries of the Cold War. Bernal's attacks on militarized science in the West led to his removal from the Council of the British Association for the Advancement of Science in 1949. He incurred further enmity for his stand on biological warfare during the Korean War. But he will probably best be remembered for his crucial research on the physics of air raids between 1939 and 1945. The value of his contribution to the Allied war effort was recognized in his appointment as a personal science adviser to Lord Mountbatten. Bernal's dedication to peace has since been commemorated in the establishment of the Bernal Peace Library.

Scientifically and politically, the goals

which Bernal set himself were often beyond his reach. Yet when we consider how far his aims transcended those of almost all his contemporaries, we cannot help but admire the audacity and nobility of his life.

Thirty years ago Bernal wrote of the seventeenth-century philosopher Comenius that

"Where he excelled was in having in his own person the knowledge and experience that existed elsewhere scattered in many minds; and in having a burning faith in the practicability of what he propounded. In essence Comenius' mission was a religious one. . . . For him toleration, peace and justice were far more necessary elements of true religion than exhortation or force; education was the means by which it should be spread."

That tribute can now be extended to Bernal himself.

## Announcements

### University News

**Dr W. G. Chaloner**, University College London, has been appointed to the chair of botany tenable at Birkbeck College, University of London.

**Mr P. S. Byrne** has been appointed professor of general practice in the University of Manchester, and **Mr F. A. Langley** has been appointed to a personal chair in obstetrical and gynaecological pathology.

**Dr E. M. Symonds**, University of Adelaide, has been appointed to the foundation chair of obstetrics and gynaecology in the Medical School of the University of Nottingham.

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