Perspectives

J D Bernal (1901–1971) in perspective

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“Freedom is the recognition of necessity”.

Friedrich Engels (1820–1895)

[The title chosen by Bernal for his collection of essays]

“The greater the man the more he is soaked in the atmosphere of his time; only thus can he get a wide enough grasp of it to be able to change substantially the pattern of knowledge and action”.

J D Bernal

“Science and History” 1954

“The world is either the effect of cause or of chance. If the latter, it is a world for all that, that is to say, it is a regular and beautiful structure”.

Antoninus Marcus Aurelius (121–180 AD)

“Meditations”, IV, 22

“In less than a generation we have witnessed a radical, irreversible, world-wide transformation in the way that science is organised, managed and performed”

John Ziman

“Real science: what it is, and what it means”, 2000

1. Introduction

Desmond Bernal was professor of physics and crystallography at Birkbeck College in London from 1938, when he was a newly elected Fellow of the Royal Society, until about 1968, when his health had finally given way. He died in 1971 after steadily increasing disability. Bernal was one of the most remarkable figures of his time, a visionary, the major founder of molecular biology, one of the great intellectuals of the twentieth century, in the first year of which he was born, the most eventful century in human history, the course of which he influenced to a significant extent. This was the century characterized in the book by Eric Hobsbawm, Bernal’s contemporary at Birkbeck College, as the “Age of Extremes”. Bernal took an important part in the war as a man of action, particularly with Solly Zuckerman in applying science to explosives and to their actions on people and cities3 and in Combined Operations. He developed significant areas of social science. He was the closest in our generation to being a universal man, except, as he would have pointed out, in the fields of sports and music. He had vision, but at times there were things, some large, some small, that he did not like to see. He was a Utopian socialist, but was fortunate in that from time to time he was indeed “able to change substantially the pattern of thought and action”. He saw in the Russian revolution of 1917 the hope for a new type of society but did not live to see those hopes disappear.

At the beginning of Homer’s Odyssey, Odysseus is introduced with the word “politropos”, variously translated, such as “of many stratagems, versatile, wandering, ingenious”, but meaning active in very many dimensions or directions. “Polytropic” is thus the word we should coin to describe Bernal and is the aspect of his life that I would now wish to emphasise. The problem is that of the scientific career, the absorption of such a person into science, where nowadays usually single-minded pursuit of a single objective is what produces a Nobel Prize. He might have had a Nobel Prize for his work in the 1920s and 30s on the structure of biological molecules; after the war his contributions were many but more diffuse. The Nobel archives will, in due course, explain the prize situation, but his bibliography gives a clear picture of manifold activities.

We cannot deal only with Bernal’s scientific work, which in any case was starved of official support. There are grounds for supposing that both before and after the war Bernal’s political activities counted against him as regards scientific funding4. He never had a big institute in the modern sense and did not dispose of large funds or large numbers of people5. Conflict between Bernal and
the Master of Birkbeck College (John Lockwood) on the role of science in the college, probably shortened the lives of both. His laboratory and department were typical of “small science” and only after his death did his department laboriously climb up to deal with “big science” as it emerged to be the prevailing style, with big central facilities like the synchrotron and the nuclear reactor. Bernal operated by influence and inspiration. He proposed problems and encouraged others to pursue them. To have as his first students, Max Perutz and Dorothy Crowfoot Hodgkin, must have been reward enough, although later in the 1950s Aaron Klug and Rosalind Franklin added still greater distinction to the laboratory. There were, of course, many others. Half a dozen fellows of the Royal Society emerged. Usually Bernal discussed problems, solutions and tactics, but left his colleagues to do the experiments and write the papers. He was a master at summing up the situation in almost any given field and was often called upon to do this at scientific meetings. His picture of the world was a unified one and he fitted new facts into a changing whole. His changing unified world picture could certainly have adapted to incorporate the changes in science, but it would have been of greater interest to see how it would have accommodated to the political changes.

Bernal was deeply engaged in politics from outside the official world and indeed he quoted Paul Langevin who said “The scientific work that I can do can be done by others, but unless the political work is done there may be no science at all”. What can an individual do for what he believes in on rational grounds which can be quantitatively argued? He did what he could and in the 1930s Bernal was said to be a member of some 50 committees concerned with science, society and politics and this must have been the state for most of his life.

Bernal lived in desperate times and times remain desperate today. It is difficult to explain to a later generation what the years 1940 to 42 meant in Britain. Only after the Battle of Stalingrad (February 1943) did light begin to return. Later, the Cuban Missile Crisis of October 1962 was also an extremely tense period. This, and the simultaneous crisis in college relations, no doubt contributed to Bernal’s stroke in 1963 which set his health into a serious decline.

2. Change and conflict

We are now again on the hinge of history. The future may tilt one way or the other, to chaos or to a new international order, welcome or unwelcome. Science and the world in