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World Without War

On the writings of Professor Bernal* there is one comment that needs to be made, and it may as well be made at once. We should be conscious of communing with a mind the qualities of which have no scientific parallel that is easy to recall. It may be necessary to go back to some of the speculative minds of the Renaissance. Like them Bernal inclines to take all knowledge as his pastime; and like many of them, it may be added, he would probably be prepared to suffer for his humanism. As a scientific worker his position is secure, resting as it does upon the contributions he has already made within his own field of research. To use one of his chosen phrases, he is certainly an authentic element among the 'growing points' of science to-day. But that could be said of a number of his contemporaries in the world of physics or chemistry or biology. It does not explain the peculiar quality of his mind.

I am not suggesting that he is a master of dialectic and exposition; his critics might reasonably differ on the question. What I am asserting is that we have here a form of wide-ranging speculative and analytical thought, that demands our respect and even our affection. It is worth our while to give ourselves over to it unreservedly, simply because this is a scientific experience likely to be almost unique in our own lifetime.

There are three elements to be noted in Bernal's intellectual composition. The first is his deepening conviction that it is a scientist's duty to identify and formulate the major problems of his contemporary world, as much as it is his duty to attack the immediate research problems that call for solution in the laboratory. To associate oneself with the effort to solve oppressive world problems is not the duty of the scientist alone; but to the scientist it falls with special emphasis, because in this scientific and technological world of ours human problems emerge largely as a by-product of the advance of science and can only be solved by wider and also wiser sweeps of the scientific imagination. It is this faculty of scientific imagination that is the second element to which I want to call attention.

Bernal's earliest writings showed that he possesses it in a remarkable degree. I would describe it as a cultivated aptitude for analysing any physical or chemical techniques one encounters, for looking at them from a new angle, for questioning long-accepted methods and traditional materials of production, and for encouraging one set of technical ideas to fertilise man's thinking about all other and

* J. D. Bernal, *World Without War* (Routledge and Kegan Paul, 25s.).

apparently dissimilar fields of invention and design. This faculty of Bernal's avoids crossing the fatal borderline into 'science fiction' because it rarely or never dreams beyond the established facts of scientific research. At its best it can be intensely stimulating; and it is surely an essential attribute of any mind that dares to contemplate the prospects of a world without war, a world in which all wars and cold wars would surprisingly have become one of the closed chapters of history.

Yet, as a third element, Bernal's weakness seems to me to be that he is rather removed in thought from the human beings whom he wishes to persuade and whom he is unquestionably anxious to benefit. The time factor of change and reform is always difficult to forecast. But in order of predictability progress in mechanics and engineering is the simplest to tackle, that in biological affairs more difficult; and most complex and elusive of all are the social and psychological elements that are inevitably involved. It is not only that the book is a little lacking perhaps in the persuasively constructed form that a crystallographer of all men should have been able to impart to it; the reason for that is Bernal's own eagerness to insist again and again upon the importance of his main argument. More to the point is that his readers being human are likely to be very sensitive to precisely those half-conscious doubts, prejudices and perversities that make our species what it is. They may feel that he does not always identify and face penetratingly enough our apprehensions about the true policies of 'the East', about the length of time the agricultural revolution will take to run its course, and above all about the time factor we have to allow for before the human population of the world is sufficiently awakened to be capable of controlling its own insurgent fecundity.

In speaking of a world without war we are bound to mean (and Bernal does mean) the nuclear war we now have to contemplate. We are really dealing not with one but with two new and utterly disturbing inventions, that of the nuclear bomb and that of the 'cold war' as a form of relationship among governments. It is their combination that makes our situation so incredibly alarming. If a state of 'cold war' can be said to have existed at times in the classical or the mediaeval world, its range was limited and it often wore itself out in border conflicts. But it has now almost become to some Statesmen a philosophy of international politics. For such men it is no longer the theory that war is diplomacy carried on by other means; rather do they conceive 'peaceful' relations to be war carried on by other means. They use metaphors derived, if we examine them, from many sources, as from old and outmoded wars, from commercial competition and from the card table. But their style of thought

is quite incommensurable with the destructive forces they now have at their disposal. Most of us suspect they are beginning to realize their own inadequacy. 'Defence in any ordinary sense of the word,' says Bernal (p.1), 'has lost its meaning. The only counter-move to annihilation of one side is annihilation of the other ... The policy of piling up more and more destructive bombs, multiplication of launching bases for rockets is not and is no longer believed to be a solution. Even its supporters do not really believe in it but only continue the policy because they cannot think of another'.

'Because they cannot think of another' is probably a true diagnosis. Politicians and strategists have been playing every variation they could imagine on the theme of the nuclear bomb, where they would formerly have been weaving their arguments in terms of field artillery or the range of battleships; and it is all beginning to look like a fantastic set of dream images. If we are needing a cool survey of most of the reasoned arguments against such concepts as that of 'the great deterrent', 'limited war', 'limited nuclear war', 'tactical and strategic nuclear weapons', we may use Bernal with confidence. Thus of those theorists (Kissinger, etc.), who would go back to the practices of the 18th century, he writes (p. 14), 'Where the authors have misunderstood the historic analogy is that such wars were limited, not so much because of any desire to spare humanity the damages of war, but from a realization that the means available were not sufficient to conduct any other kind of war ... So long as the potential for total destruction is there, the tendency to use it to redress the balance of the side temporarily worsted in limited warfare is likely to be overwhelming.'

Still more effective is his demonstration of the weakness of the theory of tactical nuclear weapons. 'The advocates of limited nuclear war get themselves into extreme difficulties in discussing the actual territories over which the limited war might be fought, their opinion depending to a certain extent on which side of the Atlantic they are writing from. ... It would appear that it is anticipated, at least by some high military authorities, that the limited warfare should take place in Central Europe. Others, however, do not entirely share this view, because they realize that if one takes a map of Federal Germany and draws circles of thirty miles around all the cities, there are precious few places in which a tactical atomic weapon could be dropped while sticking strictly to the rules' (p. 15).

We must here pause to recognize what it implies to be up against the thinking of Generals and of amateur strategists among the politicians. These men are compelled by their professions to make every effort to think in terms of contemporary weapons, to what-

ever lengths of absurdity it may carry them. The game is a fascinating, almost an intoxicating one. They are rarely congenital fools. They are doing their best to plan in hard objective ways; and in countries where their profession is traditionally respected, and where they are encouraged to make public statements, their influence on public opinion may be very serious. Now, while there is the possibility of war, there will always be Generals to plan strategy; and they are bound to be planning primarily in terms of securing their bases, their lines of communication and the defence of their striking forces.

I do not know that Bernal allows sufficiently for the influence of this factor, at all events in some of the major countries. He recounts one incident that may be partly legendary but is only too typical. 'An American General recently stated, in attempting to persuade the Greeks to install such a base (i.e., an underground rocket-firing base), that forty hydrogen bombs might be dropped on it without being able to prevent it from firing. What these forty would do to Greece, when five suffice to knock out Britain, was a point he did not go into. It looks as if the only survivors of a properly conducted nuclear war would be the rocket artillery men in their bunkers' (p.9). One may add that most of the High Command would also probably be in deep shelters. I am the last man to suggest that Generals are lacking in common courage or common humanity; I have never known of such a one. But the logic of their work compels them to think in this way or to admit frankly that their occupation is ended. It appears that our only course is for the major countries to agree to keep them sternly in their place, forbid them (whether on the active or retired list) to make any pronouncements on current strategy, and lay it firmly down that war has become too serious a matter for War Ministries and Admiralties.

There are those among us who hold on rational grounds that the nuclear weapon is not capable of strategic planning in any conventional sense of that term. This is not simply an ethical assumption, though the problem can never be dissociated from its ethical overtones. We do not suggest that those who take another view are stupid, merely that they are constructing their plans on untenable premises; and we may suspect that many of them are growing aware of it themselves. But the problem that should really concern us is why our arguments do not already convince much larger sections of the population. What inhibits them from sharing our views, or is it we who are wanting in sound and cogent arguments? Bernal touches upon most or all of the difficulties felt by the common people in Britain; but precisely here he seems often to fail in psychological insight. To me the difficulties are far deeper than he

appears to admit.

Take for example this question of the attitude of the Generals and of our own tendency to think of military and economic planning as only two facets of the same mental process. Writing of national economic planning (p.227), Bernal himself says, 'It is more like a military plan, where not only the intentions of the General but also those of his opponents must be taken into account as well as all kinds of unforeseen circumstances. Nevertheless, both military and economic plans are carried out, and sometimes successfully. Both depend for that success on proceeding consciously and in due order'. This is not the only occasion where he uses the military simile in speaking of economic and social affairs; and we must not forget what the memories of past wars often mean to the confused mind of the people. Wars have implied not only suffering and loss but an unwonted element of human co-operation and the sense of a shared and mighty purpose. True it is that throughout his book Bernal is trying to replace the shadow of a 'mighty purpose' realized by men in times of war with the substance of a greater and more lasting purpose in worldwide economic construction. But does he quite succeed in convincing the doubter? 'The only time,' he says of himself, 'I could get my ideas translated in any way into action in the real world was in the service of war. And though it was a war which I felt then and still feel had to be won, its destructive character clouded and spoiled for me the real pleasure of being an effective human being. The society in which everybody could be effective all their lives would be a really good society' (p.267). It is thus he feels it in his personal life; and perhaps, after all, what we need from him is a more intimate account of his own spiritual pilgrimage.

Too long and among many primitive peoples war of a kind has been an escape from the tedium of living; it gave the tribe its thrill of a common and testing purpose; it frequently had its ritualistic character. This tradition has never been completely broken. Indeed, down to the moment of the intrusion of the nuclear weapon war as a personal human experience had not changed its essential quality. The permitted and chosen literature of the young has always had a large element of fighting in it. What people are so loth to recognize is that this long era of 'war as a possible way of life' is now past and over. The tedium of living still haunts us and is reflected in gang if not in tribal wars. Until we can convince the minds of men that the old wars will never safely return, we shall not win their full adherence.

I will not here discuss the chapters in which Bernal makes his transition from the 'cold war' to his vision of a world that is with-

out war, because the strength of his case depends in some measure on the attitude of his reader. Of course the ways in which our resources and finances and energies are at present expended necessarily inhibit our schemes for ultimate improvement. Incidentally, where he deals with industry he has a great many intelligent passages on the meaning of automation and on the potentialities of chemical engineering. These and other passages on mechanized industry and transport are worth studying for their own sake by those who need a comprehensible treatment of the subject. It is clear from his style that the prospects are to him literally thrilling and exciting. But then, he is fundamentally a physicist rather than a biologist. What I want to discuss is his approach to the more critical problems of increasing food production in the world.

Broadly speaking, I must agree with the methods he propounds for expanding food production. Most of them have already been debated and many of them are in the experimental stage. He admits as did Engels before him the basic validity of the Malthusian position. He says (p-64), 'The Malthusian danger of population out-running supplies is theoretically always there, although in the last 150 years it has been successively pushed back by opening new lands and improving agricultural methods. ... If a population does not limit itself there is bound to be, as long as present agricultural methods are used, some time not too remote, perhaps two or three centuries from now - when the population of the whole world seriously presses on its total available food supply'. In a later passage (p.101) he calls attention both to the causes of population increase and to the warning symptoms of their effect. 'The humane alternative is to insist that the operation of maintaining life should go with saving it ... This problem indeed is already with us in some small and densely populated places where medical research has already produced marked effects, for instance in the Caribbean Islands, Costa Rica, and the Mauritius. There the population is increasing at a rate of from 3 to 4 per cent, per annum without any corresponding increase in the food supply. However, it would appear that this excessive population increase ... will taper off as knowledge of birth control spreads and people see that it is to their own advantage to limit their families to two or three children '

This is true; and the number of small countries faced with the same problem could probably be multiplied several times over. But what disturbs me is the assumption that social progress and the spread of birth control knowledge will necessarily be accompanied by a lasting check upon population increase. The most advanced communities are behaving in an erratic way in this respect. In some the post-war 'baby boom' was followed by a gradual

decline in the birth rate, while in others the birth rate has remained relatively high. We do not yet know what conditions will permanently affect the birth rate; sociologically we are only guessing at them. Where we suspect the real causes, as with the continued low birth rates in 19th century France, we do not always consider those causes to be characteristic of a progressive socialized economy. They are more likely to be the by-products of an economy of hard-headed peasants and small industrialists and artisans. Moreover, average families of 'two or three children' with a low infant mortality would obviously have only a delaying effect on the growth of population.

Like many other writers on the problem, Bernal usually stops short at a hypothetical world population three or four times its present size. There is good reason for restraining the prophetic mood; but of course numbers will not stabilize of their own accord. The question is what debt we precisely owe to posterity. Thus (p. 272), 'At what level will it be necessary to hold down the increase of population? What are the limiting factors - food, space or simple human convenience? Food will be the first limitation, at least as long as men limit themselves to extracting it from the soil, rain and sunlight in traditional ways. The limit of eight billion people (i.e., in Bernal's usage 8,000,000,000) fixed in this way could be at least doubled if enough energy was available, as it will be from atomic power, to irrigate the present desert belt using distilled or electrically freshened sea-water, or ultimately, if it proves cheaper, by using plastically covered closed water circulation green-houses '.

It seems still proper to ask what debt if any we of to-day owe to posterity. We cannot instruct them as to the density of population they will find convenient and civilised. For all we know, they may have no interest in contemplating any natural object but 'the human face divine'. Most other species of wild animals may be extinct or virtually extinct; and our descendants may be as little troubled about the loss of them as we are about the extinction of the mastodon and the giant sloth. But suppose in two centuries posterity becomes conscious of what population density it finds comfortable. How then will it suddenly reach a common agreement on the checks to be imposed on human fecundity? Not only will some 12,000,000,000 people have to agree about it; they may well have to decide who are to have children and who not, and they must be able to trust one another to carry out the decision. It would be the greatest revolution in human affairs that could ever take place. Whatever else the ardent socialist is prepared to sacrifice for the cause, he usually clings obstinately to his last stronghold of

private freedom - his inalienable right to have with his wife as many children as they think fit.

In short, what we do owe to posterity is the gradual education of the human mind to the point at which it will be capable in its vast collectivity of controlling to a nicety the size of each successive generation. How long will this process of communal self-education take? A century or two centuries or three? We do not know. All we can say is that we had better start early. For if we do not, the posterity we shall have helped to create might be excused if they blame us for our complacent scientific optimism. This is the ultimate justification for the adherents of Family Planning; and I can find no argument against it.

In one of his rare personal comments Bernal allows for the importance of this problem (p.281). 'Because I have lived so long among such prospects and ideas they seem brighter to me than to those who see them here for the first time, and many of us are so wedded to our ordinary ways of life that we would not change them even for a better way. But then we will not be asked to do so. It is the people who come after us who will ... All that we can do is to build as good a foundation for them as we know how. As I have said elsewhere, the recovery of the spirit and practice of beauty will be one of the major features of the new age.' Emphatically I would say that we have to realize the continuity from the present to the future. An increase in the density of population all over the world is not merely a quantitative problem of food and space; progressively it brings changes in the social quality of human existence. We can at least speculate from our experience about these changes, even if we can do no more than speculate. We should speculate boldly for one main purpose, that of making each generation more conscious of the profound modifications that have to be faced.

Into these realms Bernal's brief does not carry him; and perhaps they lie outside his range of thought. But it would be unfair to ask more of him. Let me quote one of his remarks on beauty (p.269); he sees the prospect as one of the merging of the scientific with the artistic spirit. 'There is far more complexity, more information as we say now, inside the smallest speck of living matter than in all the galaxies put together, that is all the galaxies apart from whatever life may be in them; and this exploration is also enough to occupy the drive and will and interest and sense of beauty of millions of people in the future.'

But, I say again, it is not fair to ask him to go beyond his terms of reference. These are plain enough. The immediate choice is between a world of potential and annihilating war and a world that

has faced the task of abandoning war for ever. Bernal's scientific speculations are only meant to spread before us the vast field within which such far-reaching speculations become at last possible, and free for all. He is neither a prophet nor a dreamer. He is a man who initiates his readers into a world of thought that most of them, haunted by war and the fear of war, would not otherwise dare to enter. It is clear that a major nuclear war will probably change the course of history more shatteringly than any event that has taken or could take place. What would follow it is not worth our speculation. But if we avoid a nuclear war, if we manage to come to some accommodation, then indeed history will continue on its course in ways we can begin to foresee quantitatively in terms of population growth, sources of energy, supplies of raw materials and food production. But what we can in some measure foresee we must declare; and we must make it part of the scientific education of the future. For this I do not think Bernal quite sufficiently allows; he seems to take it too much for granted that our curiously complicated species will mature into generations cast after his own ardent and disciplined image. So they may in time, but not without the dust and heat of long controversy and self education.

To say that 'World Without War' cannot be reviewed unless one engages in criticism is only to praise it. Its author is that kind of man. The book belongs to the realm of continuous controversy and not to that of the rounded work of art; and this Bernal demonstrates in the postscripts he appends and seems loth to abandon. If a book could somehow prolong itself after the moment of its publication, he would still be writing. Indeed the work is best read as a series of variations upon a single theme. The *leit motif* appears again and again, as it must in all argumentative works; and only those who grasp that this is the true character of the book will be fully prepared to yield themselves up to it. For them its interest will lie as much in the simplicity of its style and its faith in Man as in its scientific erudition.

Those of us who believe in the possibility of moral advance differ among ourselves only in our conception of the dynamics of the process. Such writers as Marx and Engels did not really suppose that great social changes would be followed mechanically by a change for the better in human relations and individual sanity. But they were able and imaginative writers, and were often tempted to use phrases that might encourage in their followers a sense of easy optimism. It is this apocalyptic strain that may lead to the political disillusion that is nowadays so common; and I am not sure that Bernal has entirely escaped from the influence that the apocalyptic strain in Marxism exerts on many minds. Great social changes do not of

themselves change ' human nature '. They do, however, from time to time give human nature renewed opportunity for changing its own characteristics, if men and women only have the will and patience to carry it through. In other words, there seem to me to be naive forms of Marxism, that we have inherited from some of the followers of the original thinkers; and it is this naivete in social outlook that needs now to be corrected. As far as ' World Without War ' is concerned, there is a danger that some readers will hesitate to accept a vision of human betterment that reminds them too much of their own periods of political disillusion and bitterness. If this review helps to bring the danger into consciousness, it enhances the true value of Bernal's great contribution.