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Realizing The Dream! – Give us a student, we give back a Bureaucrat
The Scientist's Role

Aldous Huxley

It is fashionable nowadays to say that Malthus was wrong, because he did not foresee that improved methods of transportation can now guarantee that food surpluses produced in one area shall be quickly and cheaply transferred to another, where there is a shortage. But first of all, modern transportation methods break down whenever the power politicians resort to modern war, and even when the fighting stops they are apt to remain disrupted long enough to guarantee the starvation of millions of persons. And, secondly, no country in which population has outstripped the local food supply can, under present conditions, establish a claim on the surpluses of other countries without paying for them in cash or exports. Great Britain and the other countries in Western Europe, which cannot feed their dense populations, have been able, in times of peace, to pay for the food they imported by means of the export of manufactured goods. But industrially backward India and China -- countries in which Malthus' nightmare has come true with a vengeance and on the largest scale -- produce few manufactured goods, consequently lack the means to buy from underpopulated areas the food they need. But when and if they develop mass-producing industries to the point at which they are able to export enough to pay for the food their rapidly expanding populations require, what will be the effect upon world trade and international politics? Japan had to export manufactured goods in order to pay for the food that could not be produced on the overcrowded home islands. Goods produced by workers with a low standard of living came into competition with goods produced by the better paid workers of the West, and undersold them. The West's retort was political and consisted of the imposition of high tariffs, quotas and embargoes. To these restrictions on her trade Japan's answer was the plan for creating a vast Asiatic empire at the expense of China and of the Western imperialist powers. The result was war. What will happen when India and China are as highly industrialized as prewar Japan and seek to exchange their low-priced manufactured goods for food, in competition with Western powers, whose standard of living is a great deal higher than theirs? Nobody can foretell the future; but undoubtedly the rapid industrialization of Asia (with equipment, let it be remembered, of the very latest and best postwar design) is pregnant with the most dangerous possibilities.

It is at this point that internationally organized scientists and technicians might contribute greatly to the cause of peace by planning a world-wide campaign, not merely for greater food production, but also (and this is the really important point) for regional self-sufficiency in food production. Greater food production can be obtained relatively easily by the opening up of the earth's vast subarctic regions at present almost completely sterile. Spectacular progress has recently been made in this direction by the agricultural scientists of the Soviet Union; and presumably what can be done in Siberia can also be done in northern Canada. Powerful ice-breakers are already being used to solve the problems of transportation by sea and river; and perhaps commercial submarines, specially equipped for traveling under the ice may in the future insure a

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regular service between arctic ports and the rest of the world. Any increase of the world's too scanty food supply is to be welcomed. But our rejoicings must be tempered by two considerations. First, the surpluses of food produced by the still hypothetical arctic granaries of Siberia and Canada will have to be transferred by ship, plane and rail to the overpopulated areas of the world. This means that no supplies would be available in wartime. Second, possession of food-producing arctic areas constitutes a natural monopoly, and this natural monopoly will not, as in the past, be in the hands of politically weak nations, such as Argentina and Australia, but will be controlled by the two great power systems of the postwar period – the Russian power system and the Anglo-American power system. That their monopolies of food surpluses will be used as weapons in the game of power politics seems more than probable. "Lead us not into temptation." The opening up of the Arctic will be undoubtedly a great good. But it will also be a great temptation for the power politicians – a temptation to exploit a natural monopoly in order to gain influence and finally control over hitherto independent countries, in which population has outstripped the food supply.

It would seem, then, that any scientific and technological campaign aimed at the fostering of international peace and political and personal liberty must, if it is to succeed, increase the total planetary food supply by increasing the various regional supplies to the point of self-sufficiency. Recent history makes it abundantly clear that nations, as at present constituted, are quite unfit to have extensive commercial dealings with one another. International trade has always, hitherto, gone hand in hand with war, imperialism and the ruthless exploitation of industrially backward peoples by the highly industrialized powers. Hence the desirability of reducing international trade to a minimum, until such time as nationalist passions lose their intensity and it becomes possible to establish some form of world government. As a first step in this direction, scientific and technical means must be found for making it possible for even the most densely populated countries to feed their inhabitants. The improvement of existing food plants and domestic animals; the acclimatization in hitherto inhospitable regions of plants that have proved useful elsewhere; the reduction of the present enormous wastes of food by the improvement of insect controls and the multiplication of refrigerating units; the more systematic exploitation of seas and lakes as sources of food; the development of entirely new foods, such as edible yeasts; the synthesizing of sugars as a food for such edible yeasts; the synthesizing of chlorophyll so as to make direct use of solar energy in food production – these are a few of the lines along which important advances might be made in a relatively short time.

Hardly less important than regional self-sufficiency in food is self-sufficiency in power for industry, agriculture and transportation. One of the contributing causes of recent wars has been international competition for the world's strictly localized sources of petroleum, and the current jockeying for position in the Middle East, where all the surviving great powers have staked out claims to Persian, Mesopotamian and Arabian oil, bodes ill for the future. Organized science could diminish these temptations to

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armed conflict by finding means for providing all countries, whatever their natural resources, with a sufficiency of power. Water power has already been pretty well exploited. Besides, over large areas of the earth's surface there are no mountains and therefore no sources of hydroelectric power. But across the plains where water stands almost still, the air often moves in strong and regular currents. Small windmills have been turning for centuries; but the use of large-scale wind turbines is still, strangely enough, only in the experimental stage. Until recently the direct use of solar power has been impracticable, owing to the technical difficulty of constructing suitable reflectors. A few months ago, however, it was announced that Russian engineers had developed a cheap and simple method for constructing paraboloid mirrors of large size, capable of producing superheated steam and even of melting iron. This discovery could be made to contribute very greatly to the decentralization of production and population and the creation of a new type of agrarian society making use of cheap and inexhaustible power for the benefit of individual small holders or self-governing, cooperative groups. For the peoples of such tropical countries as India and Africa the new device for directly harnessing solar power should be of enormous and enduring benefit – unless, of course, those at present possessing economic and political power should choose to build mass-producing factories around enormous mirrors, thus perverting the invention to their own centralistic purposes, instead of encouraging its small-scale use for the benefit of individuals and village communities. The technicians of solar power will be confronted with a clear-cut choice. They can work either for the completer enslavement of the industrially backward peoples of the tropics, or for their progressive liberation from the twin curses of poverty and servitude to political and economic bosses.

The storage of the potentialities of power is almost as important as the production of power. One of the most urgent tasks before applied science is the development of some portable source of power to replace petroleum – a most undesirable fuel from the political point of view, since deposits of it are rare and unevenly distributed over the earth's surface, thus constituting natural monopolies which, when in the hands of strong nations, are used to increase their strength at the expense of their neighbors and, when possessed by weak ones, are coveted by the strong and constitute almost irresistible temptations to imperialism and war. From the political and human point of view, the most desirable substitute for petroleum would be an efficient battery for storing the electric power produced by water, wind or the sun. Further research into atomic structure may perhaps suggest new methods for the construction of such a battery.

Meanwhile it is possible that means may be devised, within the next few years, for applying atomic energy to the purposes of peace, as it is now being applied to those of war. Would not this technological development solve the whole problem of power for industry and transportation? The answer to this question may turn out to be simultaneously affirmative and negative. The problems of power may indeed be solved – but solved in the wrong way, by which I mean in a way favorable to centralization and

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the ruling minority, not for the benefit of individuals and co-operative, self-governing groups. If the raw material of atomic energy must be sought in radioactive deposits, occurring sporadically, here and there, over the earth's surface, then we have natural monopoly with all its undesirable political consequences, all its temptations to power politics, war, imperialistic aggression and exploitation. But of course it is always possible that other methods of releasing atomic energy may be discovered -methods that will not involve the use of uranium. In this case there will be no natural monopoly. But the process of releasing atomic energy will always be a very difficult and complicated affair, to be accomplished only on the largest scale and in the most elaborately equipped factories. Furthermore, whatever political agreements may be made, the fact that atomic energy possesses unique destructive potentialities will always constitute a temptation to the boy gangster who lurks within every patriotic nationalist. And even if a world government should be set up within a fairly short space of time, this will not necessarily guarantee peace. The Pax Romana was a very uneasy affair, troubled at almost every imperial death by civil strife over the question of succession. So long as the lust for power persists as a human trait – and in persons of a certain kind of physique and temperament this lust is overmasteringly strong – no political arrangement, however well contrived, can guarantee peace. For such men the instruments of violence are as fearfully tempting as are, to others, the bodies of women. Of all instruments of violence, those powered by atomic energy are the most decisively destructive; and for power lovers, even under a system of world government, the temptation to resort to these all too simple and effective means for gratifying their lust will be great indeed. In view of all this, we must conclude that atomic energy is, and for a long time is likely to remain, a source of industrial power that is, politically and humanly speaking, in the highest degree undesirable.

It is not necessary in this place, nor am I competent, to enter any further into the hypothetical policy of internationally organized science. If that policy is to make a real contribution toward the maintenance of peace and the spread of political and personal liberty, it must be patterned throughout along the decentralist lines laid down in the preceding discussion of the two basic problems of food and power. Will scientists and technicians collaborate to formulate and pursue some such policy as that which has been adumbrated here? Or will they permit themselves, as they have done only too often in the past, to become the conscious or unconscious instruments of militarists, imperialists and a ruling oligarchy of capitalistic or governmental bosses? Time alone will show. Meanwhile, it is to be hoped that all concerned will carefully consider a suggestion made by Dr. Gene Weltfish in the September, 1945, issue of the Scientific Monthly. Before embarking upon practice, all physicians swear a professional oath -the oath of Hippocrates – that they will not take improper advantage of their position, but always remember their responsibilities toward suffering humanity. Technicians and scientists, proposes Dr. Weltfish, should take a similar oath in some such words as the following: "I pledge myself that I will use my knowledge for the good of humanity and



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against the destructive forces of the world and the ruthless intent of men; and that I will work together with my fellow scientists of whatever nation, creed or color for these our common ends." (From Science, Liberty and Peace)

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