

The two maps shown above and upper right, are reproduced from a forthcoming "Food and People" pamphlet—"Are there too many of us"—prepared by the French demographer, M. Paul Vincent.



Aldous Huxley

Aldous Huxley about world

Daily Mail
Aldous Huxley, novelist and Russell, scientist and optimist, inside the covers of a ninepenny and population problems issue. The pamphlet, "Food and the People," is sponsored by Unesco, published by the Bureau of Current Affairs and distributed by the British Ministry of Education. Secondary schools, youth groups and adult education classes are encouraged to take part in the movement.

commodities are limited and that, in many places, very rich and easily available deposits of those commodities have been or are in process of being, worked out.

Thus, in the United States, high-grade iron ore is running low; so are zinc, copper, lead; so is petroleum. And this is happening at a time when a rising population with steadily improving methods of production is calling for ever-increasing quantities of consumer goods—in other words, is making ever heavier demands on the limited reserves of our planetary capital.

FOOD, PEOPLE AND POLITICS

AN unfavourable relationship between population and natural resources creates a permanent menace to peace and a permanent menace to political and personal liberty. In our days, whether there is a threat to peace depends upon whether such an over-populated country possesses an industrial plant capable of producing armaments.

There can be no aggression without the means to aggression. Lacking these means, the people of an over-populated country are confronted with two alternatives. They can either stop breeding, and so reduce the population. Or else they can go on breeding until famine, disease, political unrest and civil war combine to raise the death-rate to the point where a decreased population can re-establish a favourable relationship with natural resources.

But some over-populated countries are also industrialized; and for these there is a third alternative: to enslave or exterminate their neighbours, and so acquire more land, food, raw materials and markets.

Remembering that "God is on the side of the big battalions," the military leaders of industrialized countries with high birth-rates will feel confident of

The Double Crisis

By Aldous Huxley

"Poverty In the Midst of Plenty"

THE human race is passing through a time of crisis, and that crisis exists, so to speak, on two levels—an upper level of political and economic crisis and a lower level crisis in population and world resources. That which is discussed at international conferences and in the newspapers is the upper level crisis—the crisis whose immediate causes are the economic breakdown due to the War and the struggle for power between groups possessing, or about to possess, the means of mass extermination. Of the low-level crisis, the crisis in population and world resources, hardly anything is heard in the press, on the radio or at the more important international conferences.

Yet the low-level crisis is at least as serious as the crisis in the political and economic field. Moreover, the problems on the upper level cannot be solved without reference to the problems that are taking shape in the cosmic and biological basement. If it is ignored, the low-level crisis is bound to sharpen the crisis on the political and economic levels. At the same time, a concentration of attention and energy on power politics and power economics will make a solution of the low-level problems not merely difficult, but impossible.

In what follows I propose to discuss certain aspects of the low-level crisis and to point out how the obscure happenings in the basement have affected and are likely to go on affecting the lives of private individuals, the policies of statesmen and the conduct of nations.

It has been fashionable for some time past to talk about "poverty in the midst of plenty". The phrase implies that the planet possesses abundant resources to feed, clothe, house and provide amenities for its existing population and for any immediately foreseeable increase in that population, and that the present miseries of the human race are due entirely to faulty methods of production and, above all, of distribution. Given currency reform, socialism, communism, unrestricted capitalism, distribution, or whatever the favourite remedy may be, humanity, like the prince and princess in the stories, will be able to live happily ever after. Want and hunger will be transformed into abundance and the whole earth will become one vast Land of Cockayne.

Such are the miracles to be achieved by political and economic planning. But when we pass from these high-level considerations to a study of what is going on at the biological and ecological levels, our optimism is apt to seem a little premature, to say the least of it.

Instead of poverty in the midst of plenty, we then find that there is poverty in the midst of poverty. World-resources are inadequate to world-population. And meanwhile world population is rising. It is rising at the rate of about two hundred millions every ten years.

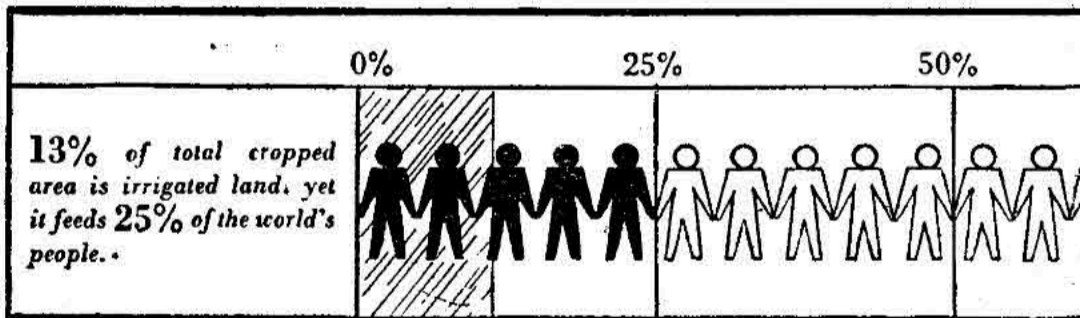
thirties. But within the next twenty-five years the population of the United States will rise (if nothing untoward happens in the interval) by about thirty millions.

What is happening in North America is happening also in other parts of the world. Erosion is rampant all over Africa, where a rapidly increasing native population clings tenaciously to its old habit of measuring social status in terms of cattle. There are more people, therefore more cows, therefore more over-grazing, therefore more erosion.

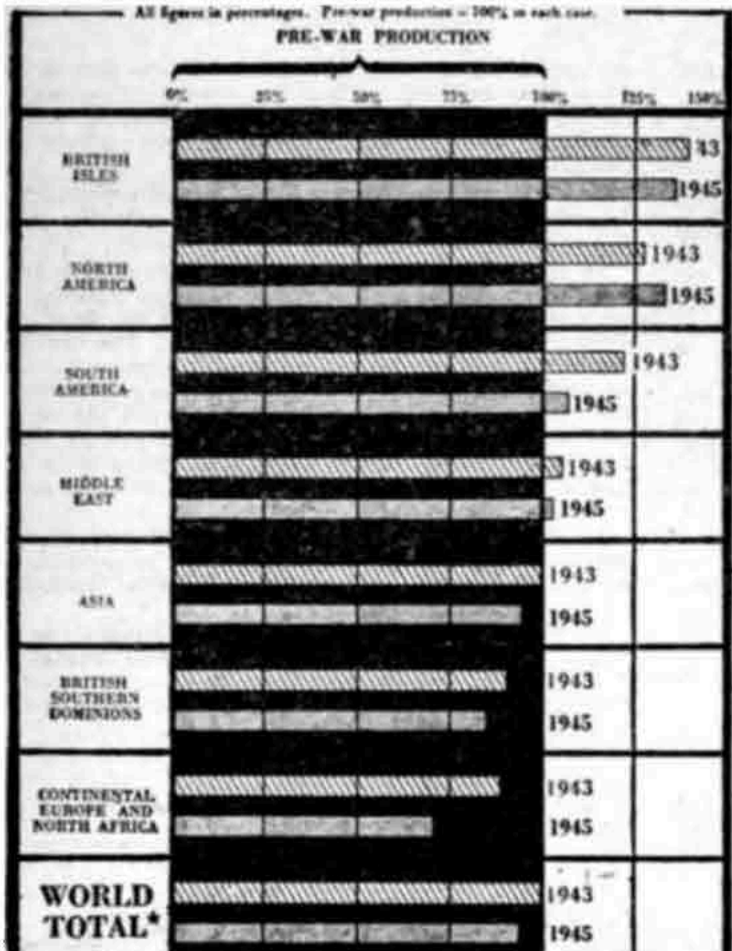
In Asia too, the same irreparable damage is being done to the very foundations of any possible civilization. Human poverty exists in the midst of a steadily increasing natural poverty.

More People—Less Food

SINCE 1800, Western Europe has trebled its population. This increase was made possible by the exploitation of the empty and agriculturally virgin territories of the New World.



WORLD FOOD PRODUCTION SINCE THE WAR



* Most of the remainder of the total was produced by the U.S.S.R., where wartime statistics on food production have not been published. (Reproduced from "Current Affairs")

Soil-Erosion Menaces Civilization

MOREOVER while population goes up, the fertility of the soil declines. Atomic warfare can destroy one particular civilization; soil-erosion can put an end to the very possibility of any civilization. Favourable weather has prevailed in North America for the last eight years and, in consequence, we hear much less of erosion than was heard during that succession of dry seasons which called the Dust Bowl into existence.

Nevertheless, in spite of considerable improvement in agricultural practices, soil-erosion still goes on and is likely, as soon as the continental weather takes another turn for the worse, to assume the same disastrous proportions as it did in the

Today the New World has a large and rapidly increasing population of its own and soil, after more than a century of abuse, is losing its fertility. There is still a very large exportable surplus of food; but as numbers go up, and fertility goes down, there will be less and less to spare for the hungry in other parts of the world. Moreover, the manufactured articles which Western Europe exchanged for food and raw materials have tended to become less acceptable in proportion as the nations of the New World have developed their own industries.

Food is a renewable commodity. If the soil is not abused, this year's harvest will be succeeded by next year's. But the vein of tin or copper which produced this year's output of ore will not be renewed in years to come. When the lode has been worked out, the miner must move on to another deposit of the mineral. And if he can find no other deposits—well, that is just too bad.

Industrialism is the systematic exploitation of wasting assets. The thing we call progress is in many cases simply acceleration in the rate of that exploitation. And such prosperity as we have known up to the present is the consequence of rapidly spending the planet's irreplaceable capital.

How long can the accelerating dissipation of capital go on? How soon will the wasting assets of the world be exhausted? All we know for certain is that the supplies of many hitherto essential

winning any war they care to wage against the countries with low birth-rates. And remembering that David killed Goliath with a stone from his sling, the military leaders of the countries with low birth-rates will come to believe that their only chance of survival consists in using, before it is too late, their technical superiority in atomic and biological weapons, in order to offset the effect of the big battalions.

So long as it remains axiomatic that nations exist for the purpose of damaging or destroying one another, the unequal increase of world population is no less dangerous, politically speaking, than the over-all increase of population pressure on resources...

A Time of Gravest Danger

ASSUMING for the sake of argument, that, in spite of nationalism and militarism, a world population policy should be agreed upon, how easy would it be to get that policy implemented? The answer is that, in the countries where its immediate implementation would be most desirable, it would be exceedingly difficult, indeed almost impossible, to do so... [And] even if a substantial cut in the present high birth-rates of the world were to take place tomorrow, the number of persons in the reproductive age-groups is at present so large that, despite the reduced birth-rate, over-all population would continue to

Huxley argues world's food

Reporter
 and pessimist, and Sir John
 Huxley contradict each other
 in pamphlet on world food
 published in London today.

Says Huxley: "Instead of
 poverty in the midst of plenty, we
 find that there is poverty in the
 midst of poverty. World resources
 are inadequate to world population."
 "At the present time our planet
 supports a little less than two and
 a quarter thousand millions of

increase until at least the end of the
 present century.

In the most favourable circumstances,
 we can reasonably imagine, world popu-
 lation is bound to rise to at least three
 billions before it starts to decline. This
 means that, whatever happens, the next
 half-century will be a time of the gravest
 political and economic danger.

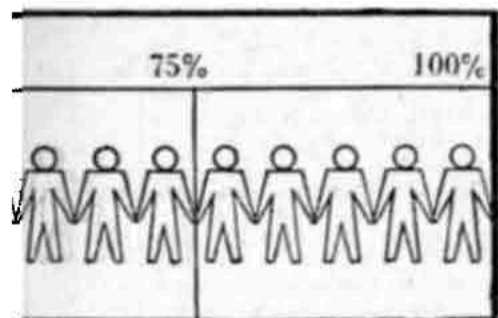
If a world population policy should be
 agreed upon and implemented in the
 near future, this danger may be expected
 to grow less acute after about the year
 2,000. If no such policy is adopted the
 crisis is likely, unless something startlingly
 good or something startlingly bad should
 happen in the interval, to persist for
 many years thereafter...

The problem requires simultaneous
 attack on several fronts—the ideological
 front, the organizational front and the
 scientific-technological front. On the
 ideological front the formidable enemy
 to peace is nationalism; for it is in the
 context of nationalistic thinking that
 over-population becomes most dangerous.
 The depth and sincerity of religious
 belief are measured by the sacrifices
 which the believer is prepared to make
 for it. At the present time there are
 probably a thousand men and women
 prepared to undergo martyrdom for the
 local national idol, to everyone who
 would willingly die for his or her belief
 in God. Of all the motives for mass
 action, nationalism is, at present, by far
 the most potent...

A World Food Policy?

THE world's supply of food can be
 increased in the following ways:
 by improving existing methods of
 production, conservation and distribu-
 tion; by opening up hitherto unexploited
 areas of land and sea; and by developing
 techniques for transforming easily avail-
 able materials into nourishment, either
 directly for man or indirectly for his
 domesticated animals, insects and fungi.

The international Food and Agriculture
 Organization of the United Nations exists
 for the purpose of considering, and mak-
 ing recommendations about, these ways
 of increasing the world's food supply. The



organization possesses no authority, and
 one of its ambitious schemes—the Orr
 Plan for a World Food Board empowered
 to buy and distribute surpluses, to stabilize
 prices and preserve an "ever-normal gran-
 ary"—has been rejected by a majority
 of the governments concerned.

But there are other ways of getting
 results: the delegates to the F.A.O. are
 extremely competent, and we can cer-
 tainly count on them, in the years ahead,
 to do as good a job as the various na-
 tional governments, to which they are
 responsible, will permit...

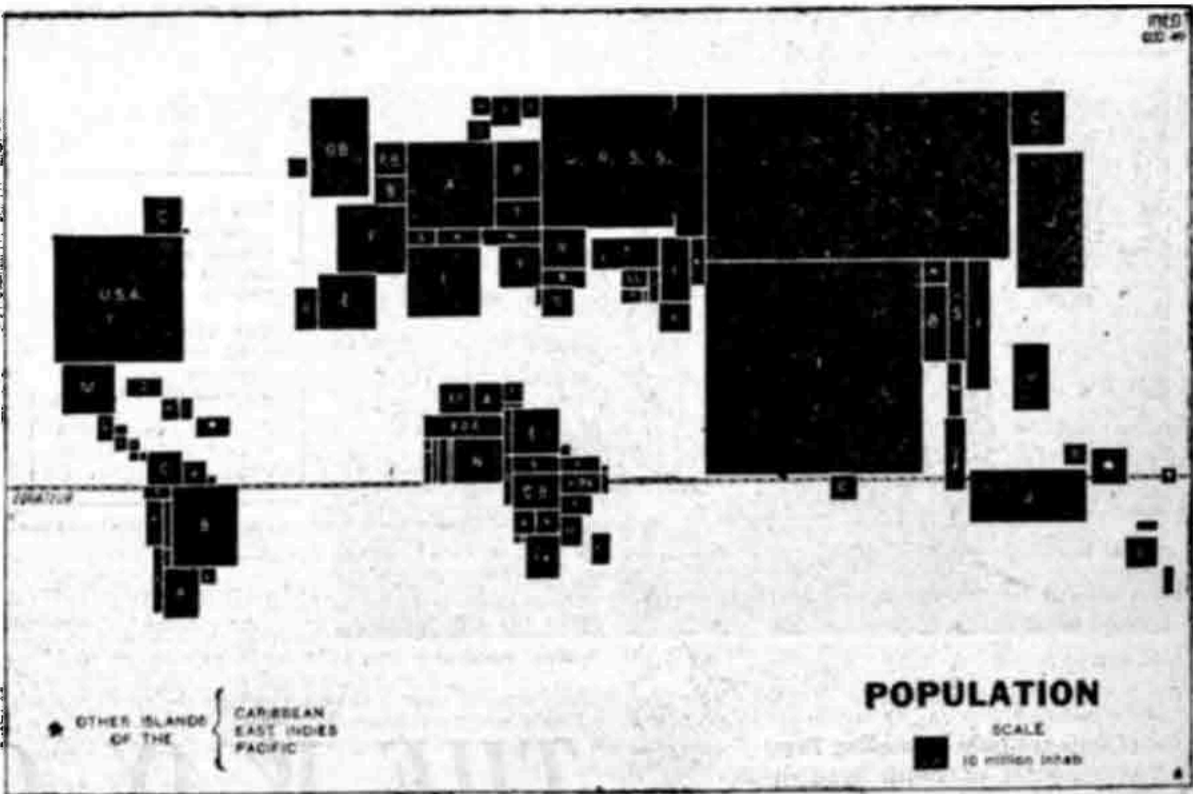
WHEN one looks at a map of the
 world... shaded according to the
 density of population, one sees
 that large areas are almost uninhabited.
 Most are uninhabited because, under
 present conditions, they are uninhabit-
 able. In some places the expenditure of
 more or less considerable quantities of
 human labour and capital might change
 the conditions and make the land pro-
 ductive.

As world population rises and the
 demand for food yet further outstrips
 the supply, it will become increasingly
 worth while to spend time, work and
 money on tasks which, in present cir-
 cumstances, are economically unjustifi-
 able. And if atomic power can be harness-
 ed without too much danger, and made
 available at a very cheap rate, many
 projects at present quite unjustifiable
 would become matters of practical policy.

(Continued on Page 8)



Sir John Russell



THE WAY OUT ?

By Sir John Russell

MR. HUXLEY'S thesis is extreme-
 ly ingenious and well argued.
 I disagree completely with most
 of his conclusions, through there are
 some with which I fully concur, in par-
 ticular, the necessity for more food pro-
 duction...

The way of mankind has always been
 and in all probability will always be
 hard... (and) only by strenuous and
 well-directed work can our problems
 ever be solved; but I am convinced that
 man can conquer his difficulties as they
 arise...

I must emphasize the impossibility of
 setting any limit to the world's resour-
 ces. Estimates made forty years ago are
 in most cases far below those that would
 be made now...

It is equally impossible to forecast the
 world's population over any long period.
 Judging from the past, it seems safe to
 assume that where standards of living
 rise, birthrates tend to fall and the pro-
 portion of older people tends to increase;
 on the other hand, among peasant popu-
 lations where children are an economic
 asset the birth-rate is high.

I shall deal mainly with world food
 resources: these depend on the amount
 of land available, the use to which it is
 put, and the size of the population that
 has to be fed. The world population is
 estimated at about 2,200 millions and
 the present rate of increase at about
 20 millions per annum. I shall assume
 that this rate continues...

The total land area of the world is
 about 36,000 million acres, but only a
 fraction of this can be cultivated.

The food problem is most serious in
 Great Britain, North-West Europe (ex-
 cepting Denmark) and India. The pos-
 sibility of trouble was foreseen by
 Malthus in 1798, but the fears were
 allayed by the opening up of North
 America... Fears of impending shortage
 have been recently revived by Sir John
 Orr, first director of the Food and Agri-
 culture Organization; Sir John has
 raised a new problem: the need for re-
 lieving the under-nutrition from which
 a large part of the world suffers.

More Land to Grow Food Expanding Into the Dry Regions

THE customary methods of farming
 break down when the annual
 rainfall is less than about 18 inches.
 The North American pioneers who
 pushed westwards beyond the 18-inch
 region met the difficulty by developing
 methods of soil management which con-
 served moisture, and by modernizing the
 ancient art of irrigation; these methods
 were all empirical but they worked...

The most effective way of overcoming
 dry conditions is by irrigation. Two
 general methods are adopted: from
 canals and from wells.

Canal irrigation is largely concentrated

around the Himalayan rivers flowing
 southwards in India, Pakistan and
 Burma and eastwards into China. The
 greatest of these schemes is the Lloyd
 Barrage in Sind, which waters five
 million acres of crops, the various Punjab
 schemes water nearly 18 million acres;
 it is known that the Tigris-Euphrates
 system has great possibilities for the
 future.

River valley developments, on the
 pattern of the Tennessee Valley Author-
 ity, are under way in many parts of
 the world. In such projects as Brazil's
 San Francisco Valley Authority, French
 West Africa's Niger River Authority,
 and Mexico's Papaloapan River Commis-
 sion, irrigation is but one factor in a
 unified system of power, flood control
 and soil rehabilitation.

The other method, irrigation from
 wells, also very ancient, has been greatly
 improved by the tube wells first de-
 veloped in California and much used by
 Sir William Stampe in India... (Stampe
 has urged that the possibilities in Africa,
 Arabia and the Middle East should be
 investigated.)

One of the most serious troubles fol-
 lowing on the so-called "conquest of the
 drought" has been soil erosion; for long
 it was hardly perceptible... By 1935,
 however, it had become so serious that
 a Soil Conservation Service was set up
 in the United States; similar services
 have been established throughout the
 British Commonwealth. Methods of pre-
 vention and rehabilitation have now been
 devised and are being continuously im-



proved... Soil erosion is no longer the
 menace it was—though constant watch
 by experts is needed.

Widening The Temperature Range

CANADA led the way in pushing the
 wheat belt further north into the re-
 gions where the summer, though hot
 enough for the growth of wheat, did
 not last long enough to allow of ripen-
 ing... The possibilities of the regions
 still further north are being studied by
 the United States in Alaska and by the
 USSR. While no surplus could ever be
 expected, there is the hope of producing
 more and better for those who live there.

At the other extreme, cultivation is
 being pushed into the hotter regions in
 Queensland... The most ambitious sche-
 mes are in Africa.

Science And Wheat Production

THE beneficent results of applying
 science to agriculture are well seen
 in wheat production. This is really
 a dry region enterprise...

The United States greatly increased its
 production of wheat during the war,
 and from being only a small exporter,
 or even an importer, has during the war
 years produced an additional 300 million
 bushels, much of which was exported.

There seems every justification there-
 fore for expecting that the great wheat-
 supplying countries can expand their
 production considerably if the need
 arises...

Maize, Rice And Millets

OF the other food grains, the three
 chief are maize, rice and the
 millets. Maize is very fully studied in
 the United States, its chief producer, and
 the remarkable results obtained in recent
 years with the new hybrids give hopeful
 promise for the future.

The millets have not yet been ade-
 quately studied. Their tolerance of hot,
 dry and poor conditions make them
 extremely important as food in the semi-
 arid hot regions of India and Africa...
 They are almost a virgin field for the
 geneticist and plant breeder, but the
 pioneering investigations promise no
 easy or spectacular successes.

Rice is more important because rice
 eaters probably outnumber the wheat
 eaters. It has been much studied in India
 in recent years and already the yields
 on the experimental farms are not
 uncommonly double those obtained by
 the neighbouring peasants.

The Overcrowded Lands

A. Great Britain And N.W. Europe

YIELDS per acre and output per
 man (in Great Britain) are among
 the highest in Europe and are
 three or four times greater than in
 Eastern Europe and the USSR; they are
 still rising. No British expert believes the
 limit is yet reached...

But our cultivated area is still shrink-
 ing, and as the population rises, more
 imports will become necessary; not
 however beyond the visible possibilities
 of the exporting countries to supply. The
 inexorable condition is, of course, that
 they must be paid for by harder work.
 Without this the standards of life must
 inevitably fall.

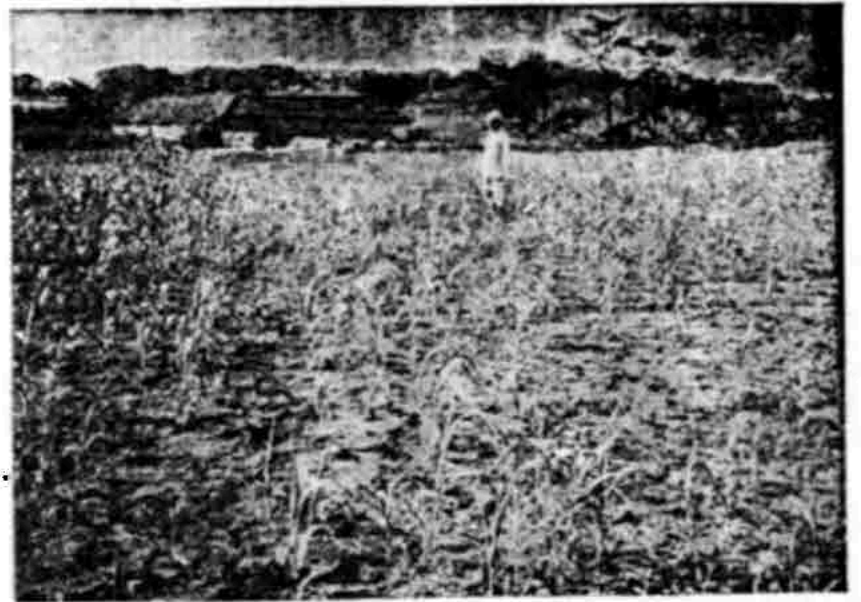
(Continued on Page 8)



The success of dry farming methods is illustrated by the Indian millet crop, shown on the left.

For the adjoining land (on right) dry farming was not employed.

Photos by permission of Sir John Russell F.R.S.



(Continued from preceding Page)

The countries of North Western Europe, including Western Germany, are in a similar position, needing to import food; they were, however, taken as a group, self-sufficient in meat and dairy produce before the war. There was then so much movement of grain from the Danubian countries and Poland to the West that the net European deficit of wheat and rye amounted only to about 5 per cent of the total consumption... If the former east-west movement of grain is restored, Europe's bread supplies will be secure, but unpredictable political factors come into play. There is no physical reason why North Western Europe should suffer food shortage as long as there is peace.

B. The Indian Problem

Of all the food problems of the world, India's and Pakistan's are probably the most difficult. The population has grown rapidly, from 306 millions in 1921 to 338 millions in 1931 and 389 millions in 1941; increases of 10 and 15 per cent respectively... Population increases at the present rate would, unless yields rose, require an additional 3 or 4 million acres of food

THE WAY OUT ?

crops each year. There still remains uncultivated land equal in area to about 70 0/0 of the cultivated land, some of which can be utilized. But the greatest hope is by increasing the ryots yields. More irrigation, more fertilizer, better cultivation and better seed are all being developed.

India's rainfall, however, is always uncertain, and importation of rice is always necessary. There are abundant potential supplies in Burma, Siam and Indo-China... It seems impossible, however, for India's food problems to be solved if the population goes on increasing at its present rate.

C. The Double Task

INCREASING output per man, and output per acre, in the old occupied lands, is really the crux of the world food problem; for it is estimated that some 90 0/0 of the world's food is consumed in or near the land of its production and only about 10 0/0 is put on to the world market; further, that about

70 0/0 of the world's population are food producers or their direct dependents.

It is this 70 0/0 who determine the fate of the remaining 30. Presumably they would be the last to feel the pinch of hunger, should it come. Most of them are peasants, their chief produce is grain, and much of their farming is very inefficient, with no great possibility of improvement as it stands.

There no longer are peasants in Great Britain but there were up to the 18th century, and their systems and output were on a level with those of the present day peasants of Eastern Europe. Great Britain then changed its system... Denmark effected the change later; the farms had to be smaller, but a system of co-operation has been developed which has led to high efficiency of production and a standard of living that is the envy of most of Europe and far above anything in Eastern Europe and beyond.

The fundamental difference between the peasant and the Western farmer is that the peasant is a self-sufficing unit, producing mainly for himself and his family, selling only his surpluses, while the Western farmer is producing for the market...

One farm worker in Eastern Europe and the USSR produces food equivalent to the needs of some four or five persons, including himself, but in Great Britain and Denmark the production per man is about four times as high, one man feeding perhaps 10 or 20 persons, who then become available for other occupations.

D. New Methods of Farming

AN entirely different system, collective farming, has been adopted in Soviet Russia. This requires large areas of land...; it is perhaps better suited for grain production than for livestock.

Peasant farming can undoubtedly be transformed into more highly productive systems capable of producing more food of higher nutritive value and of raising output both per man and per acre.

Meanwhile, the steady advance of science and the practice of agriculture in the more advanced countries can be applied elsewhere when conditions permit. Drainage, better use of fertilizers, better seeds, better control of disease, have increased the already high rate of output in Great Britain... The average yield of milk is 600 gallons per cow, but the good farmer expects 1,000 or more.

There are still possibilities of improvement even in the most advanced countries. Losses due to insect pests and diseases are still high; the current estimate (which is little more than a guess) puts them at 10 per cent in Great Britain, while livestock diseases are estimated to lose us about 6 million full year's rations of meat, 200 million gallons of milk and 1,500 million eggs.

The Food and Agriculture Organization has estimated that mites, pests and rodents destroy some 65 million tons of the world's grain per annum—more than the entire wheat and rye supply for all Europe before the war...

E. Prospects for the Future

TWO sets of problems are involved in world supplies: the rehabilitation of European agriculture, and the expansion of our present agriculture to supply a world population increasing at its present rate.

The first of these should fairly soon be accomplished; first grain supplies, then, more slowly, dairy produce and meat should come back to pre-war level... The permanent expansion of food production can be achieved by increasing the area under cultivation, by increasing output per acre, and by reducing waste and losses.

Only about 5 to 10 per cent of the world's land area is yet used for food production to any extent and there remain considerable regions in the tropics that can be utilized with the help of synthetic insecticides and modern implements. In all countries there still remain areas that could be cultivated.

The average output per acre is everywhere considerably less than is obtained by the best of the farmers, and much levelling up is possible by education and co-operation; agricultural science and engineering are continuously advancing and even in the most advanced countries yields are increasing. The causes of the wastes and losses are gradually being better understood and brought under control. As the need arises, expansion of food production can continue and it is impossible to forecast how far it can go...

F. The Hard Way

THE change that would most increase food production would be to transform the present predominantly peasant type of rural economy to a mixed farm type as adopted in the more advanced countries.

While increases in food production can be confidently expected, they will certainly involve considerable work and much scientific study. There is no prospect of easy living; the lot of mankind will always be hard. Each nation must either produce its own food or produce goods and services that will induce other countries to produce it for them.

It is impossible to estimate the rate of agricultural progress and therefore impossible to suggest a safe rate of increase of human population. At present rates there is no need to fear shortage in our time, except in India and parts of Africa. The possibilities of scientific advancement are incalculable. What is needed is to put these advances into practice, and to treat the problems internationally. The key to the problem of FOOD AND PEOPLE is international co-operation.

THE DOUBLE CRISIS

(Continued from preceding Page)

Meanwhile, it has been reported that the Russians have succeeded in thawing out the Siberian tundra and converting it into fields of rye and wheat. Much hitherto barren land in sub-Arctic Asia and America might become productive if this can be done...

To break the politically dangerous monopolies in fertile territories and in access to the sea, chemists and biologists should be enlisted to collaborate on a series of Manhattan Projects, not of destruction, but of creation. Thus, the Germans are said to have used a method for converting organic waste products, such as sawdust, into a sugar solution for the culture of edible yeasts.

Such a technique, if suitably developed, might provide much-needed proteins for those millions who, at present, have to subsist on an unbalanced diet of cereals. And the goal of another of these projects would be the synthesis of chlorophyll, the substance which permits the growing plant to use the sun's energy to convert air and water into carbohydrates.

Up to the present the rulers of the world have been ready to lavish time, energy, money and brains upon the development of atomic and biological weapons; it might be a good thing to use the resources of applied science for the relief of the world's hunger and the removal of one of the principal causes of war.

Natural monopolies in raw materials are even more politically dangerous than natural monopolies in food. When located in the territory of a strong nation, deposits of minerals necessary to industry are a standing temptation to the abuse of military and economic power; when located in that of a weak nation, they are a standing temptation to aggression from abroad.

Research should be deliberately organized for the purpose of discovering universally available substitutes for these relatively rare and most unevenly distributed minerals. If successful, such research would have two beneficial results: it would break the natural monopolies which are so politically dangerous; and it would help our industrial civilization to shift from its precarious basis in the exploitation of rapidly wasting assets to

a more secure, a more nearly permanent, foundation.

INDUSTRIAL civilization is based upon the exploitation of wasting assets by means of man-power and the power generated by coal, oil, gas and falling water. If successfully harnessed, atomic energy will increase the available power to an enormous extent. From this, two results may be anticipated, one unfavourable, the other favourable.

To begin with we may expect that increased power will lead to the more effective exploitation and consequently to the more rapid exhaustion of the more easily available supplies of such indispensable minerals as iron, tin, copper, zinc and the like. Atomic energy will permit us to enjoy the prosperity of the spendthrift who lives gloriously for a few years on inherited capital. If this were all that could be expected, the discovery of atomic energy would be wholly disastrous. But fortunately this is not the whole story.

Given an indefinite amount of cheap power, it will become economically possible to exploit deposits whose low concentration of desirable minerals render them, under present conditions, practically worthless.

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CAN WE INCREASE WORLD WHEAT SUPPLIES?

	Areas harvested (in million acres)		Average yields (per acre (cwt.))	
	Average 1935-9	1946	1935-9	1946
U.S.S.R. (estimate)	104	73	6.4	5.6
U.S.A.	57	67	7.1	9.2
CANADA (27 million in 1937)	25	24	6.5	9.2
ARGENTINE	151	131	7.5	8.1
AUSTRALIA (35 million in 1937)	13	12	6.9	5.0
U.K.	11 (1939)	2	18.6 (1939)	19.6

The first 5 countries produced 2/3 of the world's wheat in 1946. They are also large exporters. Many others, especially China, India, Italy and France, also produce large amounts of wheat, but consume it all at home. Probably 45 million acres in Canada, 5 1/2 million acres in Australia, and large areas in the Argentine, could still be cultivated.



Population Problems of India and Pakistan

by Dr. Sripati Chandrasekhar

INDIA'S population problem arises primarily out of an extremely high fertility accompanied by high mortality which is only slowly declining. The resulting increase, which amounted to more than four million a year in an undivided India, need not constitute a problem if the Indian level of living were high enough to absorb the additional population without reducing the level of living, and if a majority of the population enjoyed the irreducible minimum requirements of decent human existence in terms of food, health, clothing, shelter, employment and leisure for recreation. But India's level of living is so low that any further addition to the number of poor families may well be disastrous.

Growth of Population

THE population of the combined dominions of India and Pakistan today is nearly 450 millions or about one fifth of the total world population. The rate of increase of the Indian population, though high, has not been abnormal. The problem in India is not however the rate of increase but the net addition to the existing population every decade.

Because of the large number of India's existing population, even a modest rate of increase of 10 or 15 per cent yields a net gain of some 50 millions, in itself larger than the population of any European country except Germany or Russia, or any Latin American country. And it is this large net addition that constitutes the problem because it nullifies all efforts to improve the admittedly very low standard of living of the Indian people. All efforts to increase the production of food, other commodities and services to give a better per capita share to the existing population are largely frustrated by this increasing addition to the population.

Fertility

AMONG all demographic factors, the rate of fertility is the most important, for international lack of balance in fertility constitutes the crux of the world population problem.

The significant fact about the Indian birth rate is not that it is one of the highest in the world but that it has shown no signs of decline during the last fifty years. In Western and industrialized countries, the decline in fertility began in urban areas, and the rural areas tended to follow the downward trend after a time lag. This has been so because industrialization has been accompanied by the widespread adoption of the planned family habit.

Though India may conform to this experience eventually, it has not been the case till now. The lower fertility in Indian urban areas must be explained in terms of adverse sex ratio where the relative paucity of females and the absence of wives constitute a remarkable feature, which will be discussed later.

Mortality

INDIA'S population growth during the last century has been conditioned mainly by the high but fluctuating death rate. Famines, epidemics, the general unsanitary environment and wars have contributed to the death rate. During "normal" years the death rate has been consistently high because of the striking lack of public sanitation and hygiene, and widespread mal- and under-nutrition of the population. It can be said with some truth that famine and epidemics alone have controlled the growth of India's population during the last hundred years.

The Indian death rate is high—30 per thousand. The recorded death rate for

1931 was 24 per thousand and 22 for 1940, but these are under-estimates because of incomplete returns. This means that more than 10 million people die every year in India.

The most disquieting factor of the Indian death rate is the high incidence of mortality among first year infants, women in child-birth and women of the reproductive age group. Nearly one-fourth of the babies born die during their first year. About half the deaths among infants occur in the first month and, of these, nearly sixty per cent in the first week. Mortality remains high throughout early childhood. About forty-nine per cent of the total mortality in any given year is among those below ten years of age, while the corresponding figure for England is only twelve per cent.

As for maternal mortality, at least 200,000 women die every year during child-birth or 100 out of every thousand!

Health Conditions

THUS, out of every hundred born, one quarter die by the time they reach their first birthday. When the fifth birthday arrives, forty per cent have disappeared through death, and when the twentieth birthday is at hand only fifty per cent are left. By the sixtieth birthday only fifteen per cent survive.

But despite the present mortality rates, the average annual addition to the population of both the Dominions was five million. During the last two decades there has been, however, a steady fall in the general mortality-rate. A further fall is bound to occur if the large-scale programmes for improving the health of the country by various planning committees are effectively put into operation.

It has been calculated that even a slight improvement in the present health conditions can save three million infant lives. When this is done, India's population will increase by not five but eight million a year. And it is possible that the 83 million increase that took place between 1921 and 1941 may take place between 1941 and 1951. A planned and purposeful control of mortality without a corresponding control of the birth rate can only have disastrous consequences for India.

Today, however, the death rate is the decisive factor in Indian demography. No comment is necessary on this inordinate and tragic loss of human lives. Nor is this all. There are many who do not die but who cannot be counted among the truly living, healthy, active and gainfully employed because of the shocking nature of Indian morbidity.

Social Factors

THE demographic situation of any region is largely the product of its peculiar social characteristics affecting in their turn births, deaths and migration. The population problem in India can conceivably be very different if the social institutions of early marriage, universality of marriage, the ban on widow re-marriage and the joint Hindu family and other institutions and attitudes resulting in an adverse sex ratio, among others, did not exist.

But as these institutions, with a socio-

religious tradition and sanction behind them, exist and condition the lives of an overwhelming majority of the people, the demographic problem has become what it is today.

EARLY marriage and universality of marriage are dominant features of the Indian social scene. While child marriage as such has largely disappeared, a majority of girls between 15 and 20 are married. The girls in rural areas marry as soon as they reach puberty, and begin bearing children early.

THE second factor is the universality of the married state. Every-one in India, sooner or later, gets married. It is a quasi-religious duty. For a representative census year like 1931, we find that 467 males and 492 females out of every thousand were married. This means, that taking into consideration all widows, some widowers, ascetics and mendicants, almost everyone of marriageable age was actually married.

Scarcity of Females

A THIRD striking characteristic of the Indian social situation is the scarcity of females. There has been a deficiency of women in the Indian population within the knowledge of the country's regular census history.

Several explanations have been offered for this phenomenon of deficiency of females. Some explain it as the result of relative under-enumeration of women. Some argue that the excessive masculinity is an index of "racial" decadence.

Some others have offered a biological explanation: "The Indian caste system with its exogamous gotra (sept) and endogamous caste is a perfect method of preserving what is called in genetics "pure line..." This explanation is at best plausible but we have very little knowledge about the presence of a genetic factor, if any, in the Hindu caste system. While there may be some truth in this explanation in the sense that excessive inbreeding is generally harmful, it does not, explain the sex ratio at birth.

The available statistics tell a different story. Actually, between the ages of 1-5, India has an excess of girls and only

at the next age group the sex ratio is reversed in favour of males. A more rational explanation for the paucity of females is that... Hindu parents put greater premium on male children and are apt to treat female children with relative neglect, especially when they are assailed by infantile ailments. This, coupled with early marriage and a high birth rate, results in greater and early death among women.

Ban on Widow Re-marriage

THE social ban on widow re-marriage is yet another reactionary feature of Indian demography. The Indian demographic situation is closely interwoven with social problems. Since most widowers remarry and since they cannot marry widows, they have to seek wives among girls much their juniors. This unequal combination from the point of view of age itself leads to an increasing number of



widows, for the old husband passes away, leaving behind his young wife a widow. And, of course, she cannot remarry.

The disproportionate sex ratio and the resulting deficiency of women keeps up the custom of early marriage for girls. As bachelors and widowers have to take brides of any age they can get, the disparity between partners is increased. This difference in age increases widowhood. Since widows cannot remarry, widowhood increases the already existing shortage of eligible brides, which means of course the paucity of women. Thus the vicious wheel whirls on.

The two significant facts about the wasteful balance between births and deaths in India are the large decennial increases in the population and the tremendous human cost at which this increase is being maintained in India.

The problem of population has to be considered in relation to the means of sustenance, mainly food supply. Nearly 70 per cent of the population is dependent on agriculture for a livelihood. As the mouths to be fed every year increase, the area of productive land diminishes.

What is the way out?

[To Be Continued]

(In our May issue, Dr. Chandrasekhar will examine some of the possible answers to the Indian population problem in terms of improved agriculture, industrialization, migration and birth control and will sum up his latest findings on the food and population situation in India.)

THE DOUBLE CRISIS

(Continued from Page 8)

In other words, the harnessing of atomic power is likely to accelerate the dissipation of what may be called our high-grade capital, but it should postpone the final onset of bankruptcy by making available to industry the low-grade capital which it now costs us too much to spend...

Applied science can... be used in the fight for liberty no less effectively than in the fight for peace. Let us assume, for example, that a means will be discovered for substantially increasing the supply of food. This would have the same kind of result as the discovery of a second New World. It would make life easier for the



inhabitants of over-crowded countries and, by doing so, it would remove the necessity for some of the centralized and peremptory social controls which must always be imposed when the pressure of population upon resources becomes excessive.

Meanwhile, every day brings its quota of some fifty-five thousand new human beings to a planet which, in the same period of time, has lost through erosion almost the same number of acres of productive land and goodness knows how many tons of irreplaceable minerals. Whatever may be happening to the superficial crisis, to the crisis on the political, or industrial or financial levels, that which underlies it persists and deepens.

The current almost explosive growth in world population began about two centuries ago and will continue, in all probability, for at least another hundred years. So far as we know, nothing quite like it has ever happened before. We are faced by a problem that has no earlier precedent. To discover and, having discovered, to apply the remedial measures is going to be exceedingly difficult. And the longer we delay, the greater the difficulty will be.



A rapidly rising population and low level of living are the menacing twin evils of India.