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WAGES AND EMPIRE

BY

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THE STUDY OF ECONOMICS

' ECONOMIC investigation has hitherto fallen for the most part into the hands of lawyers and men of letters, not into those of a genuinely scientific class. Nor have its cultivators in general had that sound preparation in the sciences of inorganic and vital nature which is necessary whether as supplying bases of doctrine or as furnishing lessons of method. Their education has usually been of a metaphysical kind. Hence political economy has retained much of the form and spirit which belonged to it in the seventeenth and eighteenth centuries, instead of advancing with the times, and assuming a truly positive character. It is homogeneous with the school logic, with the abstract unhistorical jurisprudence, with the a priori ethics and politics, and other similar antiquated systems of thought; and it will be found that those who insist most strongly on the maintenance of its traditional character have derived their habitual mental pabulum from those regions of obsolete speculation. We can thus understand the attitude of true men of science towards this branch of study, which they regard with ill-disguised contempt, and to whose professors they either refuse or very reluctantly concede a place in their brotherhood. The radical vice of this unscientific character of political economy seems to lie in the too individual and subjective aspect under which it has been treated. . . . The truth is, that at the bottom of all economic investigations must lie the idea of the destination of wealth for the

maintenance and evolution of a society. And if we overlook this, our economics will become a play of logic or a manual for the market, rather than a contribution to social science; whilst wearing an air of completeness, they will be in truth one-sided and superficial. Economic science is something far larger than the Catallactics [science of money, banking] to which some have wished to reduce it. *A special merit of the physiocrats* [who flourished about 1770] *seems to have lain in their vague perception of the close relation of their study to that of external nature*; and, so far, we must recur to their point of view, basing our economics on physics and biology as developed in our own time. . . . *We must bend ourselves to a serious direct study of the way in which society has actually addressed itself and now addresses itself to its own conservation and evolution through the supply of its material wants.* What organs it has developed for this purpose, how they operate, how they are affected by the medium in which they act and by the coexistent organs directed to other ends, how in their turn they react on those latter, how they and their functions are progressively modified in process of time—these problems, whether statical or dynamical, are all questions of fact, as capable of being studied through observation and history as the nature and progress of human language or religion or any other group of social phenomena. Such study will of course require a continued “reflective analysis” of the results of observation; and, whilst eliminating all premature assumptions, we shall use ascertained truths respecting human nature as guides in the inquiry and aids towards the interpretation of facts. And the employment of deliberately instituted hypotheses will be legitimate, but only as an occasional logical artifice.’—John Kells Ingram’s ‘History of Political Economy,’ 2nd edition, pp. 240–242.

WAGES AND EMPIRE

PART I—WAGES

CHAPTER I

THE circumstances which govern wages have hitherto not been determined. The popular view for the moment is that wages are related to profits, that when profits are good wages can be high, and when profits are bad wages must be low. If this is so, then the investigation ought to be carried further, and the circumstances that determine profits should be ascertained. As it is, the belief that wages depend upon profits does not solve the problem of wages, but merely removes it one stage further away and leaves it unsolved.

No enlightenment as to the causes which determine wages is to be had from the political economy books. Each one goes its own way and gives its own account of the matter. The first view of political economy was that wages are determined by the amount necessary to keep the workmen alive. This view was based on the state of Europe, which then had a population too great to be supported by its resources, men therefore being glad to labour in order to obtain sufficient just to keep them alive. A rate of wages based on mere subsistence obtains to this day in countries that possess populations greater than their resources. It is true

that where a population is greater than its resources wages will be merely subsistential; but such a state of affairs follows from an *insufficiency of resources*. Those who put forward the subsistential theory of wages did not inquire sufficiently as to whether resources could not be increased or numbers stayed. Both these circumstances have taken place since the subsistential theory was propounded, and therefore have confounded it by exhibiting wages at the present day very much above the subsistential limit.

Malthus carried the subsistential theory a step further. He attempted to give the actual facts concerning a country's resources and population. He showed that resources were susceptible of increase, and attempted to lay down a definite rate of increase. He also attempted to give the exact rate of increase of population. On his showing, the rate of increase of population was faster than that of resources; this meant trouble and penury. He therefore recommended that the rate of increase of population should be checked as the only means of keeping numbers within their resources, and he said that thus wages could be raised.

Since he wrote no attempt has been made to add precision to his account of the increase of resources. It is obvious that some part of Malthus' argument was wrong, because population since he wrote has increased quite as fast as when he was living, but wages instead of being the same, or less, are much higher.

A further defect of Malthus' theory is that it does not tell us really the cause which determines wages, but tells us merely of the causes which depress wages and beat them down. It does not explain what determines the rate of wages where there is no competition among workmen for employment, and the places are more than they can fill.

It is, however, by following upon the lines laid down by Malthus that a true view of the circumstances

which govern wages can be had. Accordingly, this work will follow Malthus in designating the wages or living of the workman as his 'subsistence.' We shall argue as Malthus did that subsistence is synonymous with food, because it is the plenty or scarcity of food that makes the living of a nation good or poor, and it is the limits to food that place a limit to human numbers.

As Malthus did also, we shall discuss the question of the subsistence of the whole of the nation and not only of that part of it which comprises the wage-earners, but unlike him we shall return thereafter to a particular consideration of how the extent of subsistence of society as a whole affects that of the work-people.

At the very outset, however, we must distinguish conditions which Malthus lumped together and which gave rise to confusion. A people is indeed dependent upon its resources for food, but those resources are of two kinds: they are either natural or artificial. It was from the people who live on the *natural* resources of the world that Malthus drew most of his illustrations showing that the share of the subsistence was depressed through too great numbers. It was easy to show this because in such a state the amount of food is fixed (and does not increase by any progression). But the fact that formerly men relied upon the natural stores of food, and that now a few human beings do so, does not assist the consideration of the question but rather hinders it. Civilised men everywhere live upon an artificial supply of food, and the question therefore is not as to the limitations of the natural supply of food but as to the capacity for the increase of artificial food. The line of investigation into the extent of subsistence commences with the fact that men create their own subsistence, and accordingly we shall devote a short space to illustrating this fact.

Civilised men make their own food.—Hardly anywhere now are there men who rely upon the spontaneous

offerings of nature. Those who exist solely by hunting, fishing, and consuming wild vegetable growths must be sought in the Arctics, in Southern Asia, in the fastnesses of Africa, in the unexplored parts of Australia, and in the wilds of South America. They will be found few in numbers, and are the only people who do not make their food.

Not to be confused with them are other races described also as 'uncivilised' and 'savages,' but possessing in some degree the arts of vegetable and animal culture. To this class belong tribes in the northern and central parts of Asia and nearly all the inhabitants of the tropical parts of Africa. Their place, however, in an economic enumeration is with civilisation and not with the savage state.

An enumeration of the food of the inhabitants of Europe makes it clear that their nutriment is what they themselves cause to come into being and quite other, as it is indeed extraordinarily greater in quantity, than what was the natural occurrence of food. There are in Europe to-day two hundred million sheep, a hundred million cattle, fifty million pigs, and forty million horses. Of the land a million square miles is cleared of its natural growths and made to bear human food: corn, potatoes, vines, sugar-beet, vegetables, fruit, and so on, with the result that four hundred million people can live where in a state of nature a hundredth part of that number would have had the greatest difficulty in finding enough to subsist upon.

Other parts of the world witness the same facts. In the North American Continent a hundred million of the human race subsist on made food, and live very well. The wild food supplied by this area sustained at most three million Red Indians, who eked out the scanty supplies with a rudimentary agriculture and were underfed in comparison with the present inhabitants. In South America large numbers of the race

subsist where before were wilds maintaining a scanty population upon the natural produce, animal and vegetable. Australia with its four million inhabitants of well nourished food-makers is now under-peopled, while before, with half a million of human beings relying upon what nutriment they could find, it was filled to its capacity. In India and China hundreds of millions of the species, by causing almost every yard of land to produce food, live in territories which in a state of nature would not yield food enough for one in a hundred of their present inhabitants. Lastly Africa, for long in the north and latterly in the south, has yielded to the sway of the food-makers, who live in millions where before the non-food-makers in thousands suffered a dearth.

In short a world that originally was over-filled with twenty million of the species, driven interminably to war with each other to secure a part of the scanty subsistence with which nature provided them, now supports two thousand million of better-fed inhabitants. Their subsistence is brought about and caused to be by their own exertions ; and men now are themselves the makers of their food.

The manner of the manufacture of food.—If men make their own food we must next inquire into the manner in which they carry out this deed. *Prima facie*, if the human race makes its own sustenance it ought to be able to make just as much as it requires of this commodity as in the case of other manufactured commodities, and such a condition as population out-running subsistence ought to be unknown ; with more hands it ought to be possible to make more food. We know, however, that this is not the case, and if we inquire into the process of the manufacture of food we shall see why we are limited both as to the amount that the individual can manufacture and as to the total amount that any people can make for itself.

The first step in this inquiry is not to declare that food increases at any particular rate, but to examine the actual process by which food is manufactured.

This involves taking stock of the ingredients of which food is composed. Food consists of the following substances :

The ingredients of food.—Oxygen, hydrogen, nitrogen, carbon, sulphur, phosphorus, chlorine, sodium, potassium, calcium, magnesium, and iron ; these twelve chemical elements are all that count.

The following seven elements occur only in the minutest quantities, and the presence of some of them may be accidental: argon, silicon, fluorine, iodine, bromine, manganese, and copper.

These substances to be of use for food must be compounded with energy into the following forms :

The forms of food.—

1. Water.
2. Carbohydrate (water and carbon).
3. Fat (water with a larger percentage of carbon).
4. Protein (carbon, oxygen, nitrogen, hydrogen, and sulphur).
5. Salts, vegetable or animal, containing the rest of the elementary matter necessary to life.

Now men know of no method for compounding substances into food except the use of plant-organisms. The plant possesses the power of compounding matter into exactly the form required for our use.

The problem of food-making, therefore, is turned into the problem of the use of the plant-organisms, because the matter of which food consists exists in sufficient abundance (see Table No. I). The plant collects the matter which surrounds it, compounds it into suitable form, and delivers it to us as food. Our business consists, therefore, merely in securing the plant-organism and in setting it up to work, when the plant will of itself do the rest.

Now if we had a plant that gave a great deal of produce and worked ceaselessly, it might be possible with the setting up of a single plant for us to be satisfied for the rest of our lives. But the plant-organism has not been made by us ; it has been received by us from

TABLE NO. I

Table showing that the ingredients of food (other than water) *on each square mile* of the earth's dry surface suffice for 14,000,000 people.

Ingredients of Food other than Water.	Estimated Amount on Average Square Mile of the Earth's Sur- face to a Depth of 3 ft. and including the Atmosphere (after F. W. Clarke of the U.S.A. Geological Survey).	Estimated Maximum Amount re- quired for a Man's Food per Day.	Amount required to feed fourteen million Persons daily (in Round Numbers).
	tons		tons
Carbon . .	6,500	1 lb.	6,250
Nitrogen . .	620	1½ oz.	585
Sulphur . .	1,220	$\frac{1}{10}$ "	40
Phosphorus . .	3,660	$\frac{1}{10}$ "	40
Chlorine . .	6,100	$\frac{1}{10}$ "	40
Sodium . .	70,000	$\frac{1}{10}$ "	40
Potassium . .	72,000	$\frac{1}{10}$ "	40
Calcium . .	103,000	$\frac{1}{10}$ "	40
Magnesium . .	80,000	$\frac{1}{10}$ "	40
Iron . .	150,000	$\frac{1}{10}$ "	40

nature, and such as it is we must take it. In searching through the whole of the plants supplied by nature the sort that we have found the most serviceable gives individually very little food, and, having given it once, dies. It follows from this that we must set out a great number of these plants, and that we must repeat the operation as soon as they have given their yield.

Shortly, therefore, the problem of the extent of living which a man can make resolves itself into the

problem of the number of these plants that he can set out.

The question is one entirely of the capacity of the plant on the one hand, and of the strength of the human being to set them out on the other. It was found for a long time that a family working hard ceaselessly could be tolerably well supplied with sustenance by means of these plants. And there for a long time the matter remained, until with the ushering in of the modern scientific era a new light was shed on the subject. It was seen that the amount of food which a man could make by use of the plants was not constant in amount, as it had hitherto been thought to be, but that it was susceptible of being increased, so that a family need not have to work so hard to obtain its subsistence and might yet obtain a better living. And along these lines the tendency is for work to be shortened and the product to be magnified. It is well to see the principles by which this comes about, because it is in them, and in them only, that the hopes of labour lie for a shortening of their hours of work and an increase in their living.

The principles which enable human production through the plant to be increased are two: firstly, the yield of the plant can be increased, so that the same amount of work on a man's part will produce more food; and secondly, human power can be increased so that the same amount of effort exerted by a man will produce more work. This enables a man with the same expenditure of energy to set out more plants, so that besides getting a greater yield from each plant he can have more plants than before to give this increased yield.

It is as well to note the facts upon which these two principles depend.

How the yield of the plant is increased.—The occasion for the plant to synthesise more food arises, of course,

from the fact that the store of food materials present for it to work upon—the matter and the energy—is more than it uses ; while the possibility of causing the plant to give a greater yield arises from the instability of all growths and their liability to vary. Among the variations which can occur in plants is a superiority in those parts used as food. When therefore the cultivator chooses for propagation those plants which show a greater product his efforts result in a larger harvest.

It becomes thus possible to improve the plant as a worker for man and to enable a human being with the same output of his labour to obtain a larger manufacture of food. The business of evolving plants capable of more work is to-day actively pursued ; chance favourable variations are selected for breeding, and variation itself is artificially stimulated. There seems to be no finality to the improvement of the yields of plants, and owing to this fact is due the belief that men have it in their own hands, for the future, largely to increase the product of their labour.

The efficiency of the plant is susceptible of increase also in other directions. Certain influences diminish the yield of vegetable growth ; and by enabling it to withstand them the maximum amount of result may be obtained from it. Undue variations of humidity, temperature, sunlight and wind are such influences, and disease also is a cause of loss. But plants can be bred to withstand untoward conditions and capable therefore always of giving their maximum yield. An important department of science is devoted to the improvement of plants in this respect, and expects confidently to breed growths capable of withstanding almost any adverse conditions.

Further, the varieties of plants are continually being added to. The types of the plant-world are almost inexhaustible, and their uses for human purposes

are even to this day largely undeveloped and unknown. A commission lately despatched by the United States Agricultural Department to China returned with five varieties of useful plants hitherto unknown in America, and with several varieties of plants much superior to those in use in the United States. It will long be possible to extract from nature's storehouse in different parts of the world synthesising instruments, able to do more work, more apt, or otherwise more serviceable (such as affording a variety of diet), than those at present in use.

How human power is increased.—An effect parallel to that of increase in the plant's yield is produced if the extent of human energy is added to so that the same output of labour performs a greater amount of work.

Primitive man clearing land with his hands and laboriously digging it over with a stick never dreamt that his descendants would be able to clear and dig a hundred times the area with less effort. It would seem to him impossible that human strength could go any further, and that it was exhausted with the result he had brought about. Yet knowledge has brought the use of the plough and of the tamed animal; no change has taken place in men or in their hours of labour, but they have become capable of possessing many times the amount of food that they formerly could obtain.

Two principles contribute to this result: the procuring of power and its most efficient use. It was first discovered that the power of large animals could be yoked to that of men; next that the forces of inanimate objects, wind and water, could be made to amplify human capacity; and later that the inert matter of coal and oil contained energy which would yield up its strength and do an enormous amount of work. Science also learnt that in the application of force a great deal of the energy used was lost, and it

set out to save the waste. The pointed stick gave place to the spade, and the selfsame labour dug twice the quantity of earth; the efficiency of its use had been increased.

The improvement in human labour has been brought about by adding to it energy from without, animate and inanimate, and by devising instruments for the better application of energy to the business of manufacturing food.

Science has not yet succeeded in making food directly from matter and energy independently of the plant-world, but chemists in many countries are at work upon the problem. What an effect their successful efforts would have upon the expenditure of labour in making food can be gathered from the subjoined table, which exhibits the present cost of the materials contained in food.

TABLE NO. II

Table showing the price at which can be purchased the food ingredients (other than water) contained in a man's daily diet.

Ingredients.	Estimated Maximum Amount required by a Man per Day.	—
		<i>d.</i>
Carbon. . .	1 lb.	0·1339
Nitrogen . . .	1½ oz.	0·5906
Sulphur . . .	10 "	0·0046
Phosphorus . . .	10 "	0·1430
Chlorine . . .	10 "	0·0250
Sodium . . .	10 "	0·1060
Potassium . . .	10 "	0·0313
Calcium . . .	10 "	0·0004
Magnesium . . .	10 "	1·2000
Iron . . .	10 "	0·0020
		2·2368

CHAPTER II

FROM our argument so far as it has now proceeded it would seem that to better the lot of men only two things are needful: one is to improve the plant and the other to increase the strength of men. It would seem that if this is done labour must continuously produce more, and that therefore to improve the condition of men nothing more is required than to prosecute the branches of study which deal with these matters.

While it is the case that a heightening of the capacity of plants and men has this beneficial result, and while in some parts of the world these are the only factors that count, yet there is another factor which is liable to come into play and to offset the benefits of science, so that improvements and discoveries do not have the effect in raising subsistence which they ought to have.

This effect follows from the constitution of the domestic plant and the nature of the medium through which it works—the land. It must be remembered that the plant draws the materials which it is to manufacture into food from its environment—its energy from the sun, and the matter from the atmosphere and the soil. The materials for the manufacture of food through the plant should all or nearly all occur at the spots chosen for the operations. Of the carbon and atmospheric nitrogen this is always the case; but it is by no means true that the other ingredients are present everywhere either to the amount or in the

manner demanded by our plants. In the arctic and subarctic regions the amount of solar radiation, while sufficient for some forms of plant-life, is insufficient for those which constitute our food. Again, when sunlight is sufficient some of the ingredients may not be present in the first few inches of the soil—the extent to which the roots of our plants penetrate. Then also the matter for food when present may occur in a form too integrated, such as rock, or too cohesive, such as clay. Sometimes the presence of the ingredients in sufficient quantity is marred by an excess of water, preventing the circulation of air which a plant's roots require; or the contrary may occur, and water be present in too small an amount to allow of the plant absorbing the matter to hand.

There are distributed over the world certain patches of surface containing all the ingredients for food in a manner properly disintegrated, supplied with moisture to the requisite degree, and receiving sufficient energy from the sun. The area of this land is considerable, perhaps as a rule about the eighth of a nation's territory.

Now beyond these portions of the earth's surface which are naturally fitted for the process of food culture there exist many other spots that are capable by human labour and with the assistance of knowledge of being put into a condition suited for the plant's operations.

Men of course should choose for their operations of culture those portions of land which are ready fitted by nature for the processes of agriculture. And where they do choose such land the extent of their subsistence is governed only by the extent of the power and the nature of the instruments which science gives them. All men naturally would wish to carry on their agriculture on such land, and there is only one reason which prevents them from doing it, and that is that the amount

TABLE No. III

Table analysing the naturally favourable and unfavourable conditions of the earth's surface for the manufacture of food by means of the plant.

Condition of Superficies.	By Nature Favourable.	By Nature Unfavourable.	Treatment hitherto Devised for Ameliorating the Unfavourable Conditions.
Energy— 1. Radiations of solar energy	Sufficient	Insufficient	There is no remedy for a deficiency of sunlight. In Scotland, for instance, from time to time crops fail to ripen owing to the season's sunshine being insufficient.
Matter— 2. Number of ingredients Amount of ingredients	All present Sufficient	One or more lacking Insufficient	When any one of the ingredients necessary to plant-life is either absent from the soil, or not present in sufficient quantity, the deficiency must be made good. This is one of the commonest defects of land, and causes the great amount of manuring that takes place. Nitrogen, phosphorus, and potash are commonly the ingredients lacking, and practically all fertilisers are composed of these substances.
3. Water	Proper in amount	Excessive, or insufficient	Draining takes away excessive water, while irrigation cures an insufficiency of it. Water is also kept in the soil by breaking up the top with hoes, or otherwise, which causes much less water to escape. This practice is largely employed even in England.

Form of Ingredients— 4. Physical or mechanical state	Disintegrated, and sufficiently cohesive	Too integrated, too cohesive, or too incohesive	The dry surface of the world may be too integrated, as in the case of rock, too cohesive, as in the case of clay, or disintegrated but not sufficiently cohesive, as in the case of sand. Where the surface is all rock nothing is to be done, but in a stony soil the pieces of rock and stones mingled with soil can be extracted. A too cohesive soil is disintegrated by repeated ploughings and by mixing sand and bulky vegetable matter such as manure with it; and a too incohesive soil such as sand is treated by the addition of bulky vegetable matter and of clay. Where the plant food although present exists in an insoluble or unavailable form substances (<i>e.g.</i> lime) must be added to act upon the compounds and render available the plant food they contain.
5. Chemical state	Suitable	Unsuitable for assimilation by the plant	The conversion of nitrogen from the insoluble state in which it frequently occurs in humus into a form assimilable by the plant is accomplished by the action of micro-organisms, and can be effected only if the necessary organisms are present. A certain amount of progress has been made in devising means for inoculating the soil with desirable micro-organisms.
6. Biological condition	Suitable	Unsuitable	

of such land is not sufficient, or that they are too many for the extent of such land which their country contains. The result of this is that men unable to obtain for cultivation land naturally fitted turn to other land which they are able to convert into a condition suitable for agriculture. Consequently their labour does not bring them in so much as it might, because it is not all devoted to cultivation proper; but some of it is given up to rendering the land fit for cultivation, or 'ameliorating' it, as it is called. The extent to which this inferior land is cultivated, and the amount of labour wasted on ameliorating it, is responsible for the difference between the low wages of Europe and the high wages of America and other countries of the western hemisphere.

In every country of Europe (and Asia) there is in use a large quantity of land whose fertility is man-created, and must be constantly maintained. Heavy capital charges are incurred and great annual expenditure is necessary to render the land cultivable; clays are treated with sand, and sands with clay, both with bulky vegetable matter; drainage involving an annual charge of 10s. an acre takes place over a considerable part of the land of this nature; and a great deal of the annual operations of agriculture which have the appearance of being the ordinary work of husbandry—the repeated ploughings and harrowings for instance—are in truth devoted not to cultivation but to overcoming the refractory nature of the soil (see Table No. III).

As there is a disinclination on the part of those who are not practically acquainted with agriculture to believe in the incultivability of much land and of the difficult nature of much that can be rendered cultivable, an account is given here of the cultivation of the surface of the British Islands.

The following table (No. IV), although it refers only to the case of the United Kingdom, shows that the

suitability of a soil depends upon the geological formation of which it is composed.

TABLE NO. IV

Table showing geological formations of the surface of the British Islands and the nature of the superficies which accompanies each formation.

*Primary Formations.**Granite—*

Forms a rocky surface which cannot be cultivated, but in parts a little of it is broken up, making a thin soil on which nothing but grass can grow.

Trap—

Weathers into an earth and can be cultivated.

Archæan—

Gives barren rocks, with little soil to speak of.

Cambrian—

The soil it makes is thin and poor and fit only for grass.

Silurian—

The hilly parts of this will grow grass only ; but the lower parts yield fairly good soils, that are however stony and deficient in lime, which must be applied to make them productive.

Old Red Sandstone—

This group of rocks makes soils of the most noted fertility. The red soil of Dunbar, which grows the best potatoes in Britain, is in this group, while wheat ripens in the north of Scotland on this soil when it will fail on the adjacent Silurian.

Mountain Limestone—

Part of this is rocky and has no soil ; in other parts a soil has formed not deep enough to cultivate but sufficient for the growth of a good herbage.

Millstone Grit—

This makes sandy land which is useless for cultivation or for grass, and is left to grow up in heath.

Coal Measures—

These form sands and clays which require much treatment to make them cultivable.

Magnesian Limestone—

Yields a thin soil which grows a poor pasturage. To grow crops on this land is very expensive because the land must be artificially enriched.

*Secondary Formations.**New Red Sandstone—*

Yields soils of great natural fertility which are especially suited for pasture.

Lias Clay—

This is rich but too stiff to cultivate, and therefore mostly in pasture.

Great Oolite (Limestone)—

Not rich, but easily cultivated because the soil is loose. Naturally suited, however, only for barley and sheep.

Oxford Clay—

Is difficult and expensive to work and badly needs drainage; therefore nearly all down in grass. It was formerly worked by the very difficult and expensive system of building the soil up into high crooked ridges so as to drain and air it.

Weald Clay—

Is difficult to work and very wet. Much of it is therefore still in oak-forest and natural pasture.

Gault Clay—

Gives naturally a good pasture, but for arable crops requires draining, liming, &c.

Greensand—

This is of two kinds, the Lower and the Upper. The Lower is fit for nothing, and constitutes many of the unproductive sandy soils and barren heaths of southern England, while the Upper gives a light soil good for fruit.

Chalk—

Here, again, there is a Lower and an Upper, both thin soils. The Lower gives enough for cultivation, but naturally is fitted only for barley, while the Upper yields soil sufficient only for pasture.

*Tertiary Formations.**London Clay—*

Is a tenacious soil and very expensive to work. To grow corn, it requires draining, liming and barefallowing. For this reason it is mostly down in grass.

Bagshot Sands—

Are poor, sandy and gravelly, and left in heaths and copsewoods.

*Quaternary Formations.**Boulder Clay—*

A deposit left by the ice during the Great Ice Age. Makes a stiff impervious clay. Expensively farmed, it can be made into a good cropping soil and provides corn-land.

Glacial Drift—

A later deposit, consists of gravel and sand, and is in different land.

Brick Earth—

Yields a loamy soil of exceptional fertility and of great natural suitability of texture.

*Recent Formations.**Peat—*

Is composed of decayed, or partly decayed, mosses, heaths, &c. It is of no use for agriculture till drained, clayed, limed, &c.

Alluvium—

Occurs on the flats along the sides of water. It is made up of a mixture of washings from other soils, and is fertile enough; but the trouble of this land is its wetness and the difficulty of draining it.

Of the rocks with which the surface of the earth was covered those belonging to the later formations have become soft under atmospheric exposure—'weathered'—while the older formations usually remain hard and have resisted the influence of climate. They are therefore useless for sustaining human life. On the other hand, the formations which 'weather' become usually clay or sand. Sandy soils are poor, being unable to retain moisture or matter for plants, and in a natural state they are covered with a scanty, coarse, useless vegetation. Clay possesses the opposite defect: it is too retentive of moisture, and naturally supports only grass and forest trees.

Of the twenty-three formations noticed in the table there are but three which constitute soils at once friable, capable of holding moisture and matter, and yet not too cohesive. These are the soils *naturally suited* for the cultivation of food plants. In the United Kingdom they amount in extent roughly to an eighth of the total land surface.

Clays and sands, however, lend themselves in varying degrees to the work of amelioration. A further eighth

of the land surface of the United Kingdom affords sands and clays whose conversion into arable land has proved practicable.

In addition there is rather more than a quarter of the United Kingdom which, while not suitable for growing crops for men, will bear grass and pasturage for animals. Some part of this can, with the outlay of an unusual amount of labour, be made to bear crops for human food, and on the Continent of Europe a great quantity of land of this nature is so used.

In the United Kingdom, even after a great deal of the inferior land has been taken into service, only a half to two-thirds of the land surface can be used for food-making ; and this area is divided equally between men and beasts. The rest of the British Islands consists of rock which will not yield a living, and of sands and clays whose reclamation is too expensive, and which is allowed to go waste.

Table No. V. shows the actual extent to which it has been practicable to use the land of the United Kingdom for making food.

The facts that have been given in detail of the United Kingdom are true generally of the Continent of Europe and of the rest of the world. All countries have some land naturally suited for cultivation, other areas that with more or less difficulty can be turned to the use of cultivation, an expanse of land of utility only for feeding beasts, and finally tracts of land of greater or less extent that are quite useless for the support of men or domestic animals.

The extent to which the land surface of the principal countries of the world is used for making food is shown in Table No. VI. In no case does the amount exceed 63 per cent. of their land areas, and only in the case of the nations most favoured by nature is so high a percentage attained. Commonly not the

half of a country can be used for food production. It may be safely said that in the cases of the populous

TABLE NO. V

Table showing how much of the land of the United Kingdom is cultivated and how much remains uncultivated. It may safely be assumed that the heath land, the commons, the woods, the deer forests, and the bogs, amounting in all to twenty-six million acres, are incapable of profitable cultivation.

	Acres.	
Total Area	77,000,000	
Of which there is used for the manufacture of food :		
As arable land (for crops)	20,000,000	
As permanent grass (for pasture)	27,000,000	
	47,000,000	
Leaving a balance of 30,000,000 acres useless for the manufacture of food and classified as follows :		
Mountain and heath land (some of this affords rough grazing)	16,000,000	
Commons	3,000,000	
Woods	3,000,000	
Deer forests	3,000,000	
Bog	1,000,000	
Area of Boroughs and Urban Authorities	4,000,000	
	30,000,000	
	77,000,000	77,000,000

countries of Europe and Asia all the area of their territories which can be devoted to the maintenance of human life is employed for that purpose, and that therefore the extent of cultivation shown in the table

TABLE No. VI

Table showing the extent of cultivation in the principal countries of the world.

Country.	Total Area.	Used for Food Manufacture.		Forest.	Waste (Affords in Parts some Rough Grazing).	Percentage of Area Used for Food Manufacture.
		Arable Land (Yielding Food for Men).	Pasture Land (Yielding only Food for Beasts).			
	Acres.	Acres.	Acres.	Acres.	Acres.	
Denmark	9,500,000	3,000,000	3,000,000	1,000,000	2,500,000	63
Belgium	7,300,000	3,000,000	1,500,000	..	2,800,000	62
Holland	8,000,000	2,000,000	3,000,000	600,000	2,400,000	62
United Kingdom	77,000,000	20,000,000	27,000,000	3,000,000	27,000,000	61
Austria	74,000,000	28,000,000	17,000,000	24,000,000	5,000,000	60
Switzerland	10,000,000	500,000	5,000,000	2,000,000	2,500,000	55
Poland	31,000,000	14,000,000	3,000,000	..	14,000,000	54
France	130,000,000	33,000,000	32,000,000	10,000,000	55,000,000	50
Portugal	22,000,000	5,000,000	7,000,000	..	10,000,000	50
Germany (pre-war)	133,000,000	45,000,000	20,000,000	34,000,000	34,000,000	49
Rumania	32,000,000	13,000,000	2,000,000	..	17,000,000	47
Italy	70,000,000	30,000,000	..	11,000,000	20,000,000	43
Spain	124,000,000	33,000,000	21,000,000	..	70,000,000	43
Hungary	81,000,000	25,000,000	10,000,000	22,000,000	24,000,000	43
Bulgaria	24,000,000	7,000,000	2,000,000	..	15,000,000	37
Servia	12,000,000	3,500,000	1,000,000	2,000,000	5,500,000	37

WAGES

27

Finland . . .	82,000,000	2,000,000	3,000,000	..	77,000,000	28
Russia-in-Europe . .	1,244,000,000	240,000,000	70,000,000	426,000,000	508,000,000	24
Greece . . .	15,000,000	2,000,000	1,000,000	..	12,000,000	20
Turkey-in-Europe . .	42,000,000	4,000,000	3,000,000	..	35,000,000	16
Sweden . . .	101,000,000	5,000,000	7,000,000	53,000,000	36,000,000	12
Norway . . .	77,000,000	500,000	2,000,000	17,000,000	57,500,000	3
Total for Europe . .	2,405,800,000	518,500,000	240,500,000	605,600,000	1,041,200,000	30
Japan . . .	94,000,000	16,000,000	..	54,000,000	24,000,000	17
India (total area, 700,000,000 acres, but dealt with by the returns) . . .	584,000,000	360,000,000	..	82,000,000	142,000,000	62
United States . . .	2,283,000,000	250,000,000	2,033,000,000	2,033,000,000	2,033,000,000	11
Canada . . .	2,316,000,000	63,000,000	2,253,000,000	2,253,000,000	2,253,000,000	3
Australia . . .	1,903,000,000	14,000,000	1,889,000,000	1,889,000,000	1,889,000,000	1
New Zealand . . .	67,000,000	15,000,000	52,000,000	52,000,000	52,000,000	23
Total of U.S., Canada, Australia, and New Zealand	6,569,000,000	342,000,000	6,227,000,000	6,227,000,000	6,227,000,000	5

is the maximum of which the nature of their surface allows.

This recital should sufficiently demonstrate the fact that to speak of land and of cultivable land is not the same thing. Most of the dry surface of the earth is, with the means at present at our disposal, not cultivable at all. That part which is in its natural state cultivable is rather small, but other parts are capable of being rendered cultivable, and knowledge is constantly increasing the range of land which can be turned to profitable use.

The effect of the shortage of land, or of too great population.—Now the shortness of land has two effects. The good land being gone very soon it drives people to cultivate inferior qualities, and, in addition, when the inferior qualities are all gone it prevents population increasing any more. The progress of knowledge, however, both in making the hitherto useless lands cultivable and by increasing the use of the lands already in cultivation counteracts these two effects. Science increases the amount of good land, raises much of the inferior land into the category of good, and brings into cultivation whole tracts of hitherto uncultivable land, placing some of them in the superior and some of them in the inferior categories. That being the case, it may be as well to observe in detail some of the ways in which scientific progress works in bringing about this result.

How science mitigates the shortage of land.—Land may be infertile owing to its mechanical condition, owing to a defect of the ingredients for plant life, or because no useful plant capable of thriving upon it has been found.

The condition of infertility of land arising from its mechanical state, when for instance it is too wet or too dry, or is clayey or sandy, is capable of being remedied by labour. In such a case everything which cheapens

labour renders the feasibility of amelioration greater ; and labour can be cheapened by science through its discoveries of new sources of natural energy, and improvements in the instruments and machinery for applying it.

A deficiency of ingredients also can be remedied, but the cost is frequently prohibitive. There is hardly any land which will not yield to treatment by farm-yard manure if only sufficient is used. Chemistry, however, has the merit of having discovered how to supply fertility at a cost that is not inordinate. The interior of the Australian Continent was uncultivable until the invention of the superphosphate fertilisers, and the cheapness at which chemists were able to manufacture them, caused the formerly useless land to come into the range of fertility ; indeed, it is upon such land that the recent prosperity of Australia has been built up.

The most striking instance of science rendering useless land productive occurs where no change is caused to the land, but a plant is obtained capable of thriving upon it. A case of this sort was the introduction of the clover into the United Kingdom which results not only in the growth of fodder crops upon land where before very little could be obtained, but also in the enrichment of the soil for bearing corn crops.

Again a plant can be bred for the purpose of being able to penetrate to the ingredients present in the soil but out of reach of existing growths. Alfalfa is a product of this nature. By reason of its long roots it is able to descend to a great depth and extract the moisture out of reach of the fodder plants previously known. Much supposedly arid land in Australia and elsewhere has by this means been brought within the range of cultivation.

Plants also can be bred to do with less than the usual

of their requirements; such as the wheat bred to ripen earlier than the common varieties. The invention of this plant has made cultivable land in Canada and Siberia, which owing to the early frosts was before regarded as useless, and every further improvement in the breed enlarges the cultivable area of such land.

Another of the means which has made it possible to cultivate much land that before was useless arises from the increase in the yielding capacity of plants. It thereupon becomes profitable to cultivate land which with smaller yielding plants would not pay.

Moreover, the general abolition of fallows alone produced an effect equal to doubling the land of the world. Formerly each piece of land was exhausted by the bearing of a single crop, and must be allowed to lie idle for a year or more to recover naturally its fertility. The inexpensive fertilisers of the present day however render the land permanently cropable.

CHAPTER III

WE are now in a position to resume the thread of the argument. As the increase of our power to make food depended only on improving plants and adding to our strength, it seemed that nothing more was to be done to improve the lots of peoples than to persevere along these two lines. And this indeed would be, and is, the case in certain parts of the world to which we shall have much occasion to make reference presently. In those parts of the world there is a superfluity of cultivable land. But in other parts of the world it is not sufficient merely to pursue the improvement of plants and the improvement in the strength of man, though these two considerations require the same attention there as elsewhere, but it is necessary also to put to rights another very serious condition of affairs.

A man can make a good living only from good land, and if he cultivates inferior land his living will not be so good. Why then does not everybody cultivate the good land and leave the inferior alone? The answer to this we have already seen in the small quantity of good land which is available. Consequently, when the people of any country increase in numbers beyond the extent of their good land some of them must cultivate inferior land. Thus we arrive at the very important relation of numbers to land. If a people is more numerous than can be supported from the better land alone, then the average of their subsistence must be lowered from what it might be if they could restrain themselves to the use only of the good land.

Now, when people cultivate inferior land a good deal of the increased power to make food which improvements of plants and improvements of human strength give is lost. The increased yield of the plant is negated by the poor quality of the soil, and the increased power given to men is lost because it must be spent on ameliorating the land. This is why progress, civilisation, and science, although they fully obtain in some parts of the world, have not done for the mass of the people that which was expected of them.

All this is fully illustrated by a comparison of the state of Europe with that of the countries of the New Worlds.

TABLE NO. VII

Table comparing certain tracts of the earth in respect of area, density of population, and extent to which each has been laid under contribution for cultivation purposes.

—	Area. Square Miles.	Population.	Persons per Square Mile.	Percentage of Land Brought under Cultivation.
Europe	3,800,000	420,000,000	110	30
United States	3,600,000	92,000,000		
Canada	3,800,000	7,000,000		
Australia	3,000,000	5,000,000		
New Zealand	100,000	1,000,000		
	10,500,000	105,000,000	10	5

In Europe, as will be seen from the accompanying table (No. VII), a population of four hundred and twenty millions is crowded upon an area of 3,800,000 square miles, making a density of 110 persons per square mile; while in the principal countries of the New Worlds—America, Canada, Australia, and New

Zealand—a population of one hundred and five millions has at its disposal an area of 10,500,000 square miles, a density of ten per square mile. The consequence of this is that in Europe the inhabitants are obliged to eat into the land at their disposal to the extent of 30 per cent., while in the New World countries the population uses only 5 per cent. of its territory.

The effect of overpopulation in reducing productive power can be further exhibited statistically as follows. This calculation shows the product of labour in Europe and in the United States of America.

TABLE No. VIII

‘ The production of food in various countries may be compared by reducing all to a common denominator, that is, considering 100 gallons of wine or 3 tons of potatoes as equal to a ton of grain, and 1 of meat equal to 8 of grain. In 1894-96 the production on the said basis averaged as follows :

—	Tons Yearly of Food.	Tons per Farming Hand.
Germany	42,100,000	5·3
France	40,800,000	5·7
Europe	277,200,000	3·2
United States	130,800,000	14·5

Europe is obliged in the attempts to feed itself to put seven hundred and fifty-nine million acres under cultivation, while America, a country of the same size, has put only two hundred and fifty million acres of her area to the use of food raising (see Table No. VI). In Germany 49 per cent. and in France 50 per cent. of the surface of the country is used for making food, but

¹ Mulhall's *Dictionary of Statistics*, 4th edition, p. 613.

in the United States only 11 per cent. Germany and France are certainly not behind the United States either in the variety of plants which they use or in the nature of the machinery which they employ, yet the result of the labourers' work in Germany and France is only a third of what it is in America, and this although the European labourers, certainly those of France and Germany, work no less hard than those of America.

It is very clear from this that when inferior land is resorted to the power of man to make food is reduced by a half and by two-thirds, and can be even further reduced.

The circumstances in which, despite scientific progress, populousness beats down subsistence.—The effect upon men's living of the improvements in the science of cultivation is different according to the state of populousness of the countries which they inhabit.

In countries with plenty of land the discoveries of science are employed for magnifying the yield of human effort, and every fresh discovery and new invention augments the living of the people. But in countries where land is scarce the discoveries of science, while producing enhanced returns from land already in cultivation, may be also employed for bringing within the range of cultivability land hitherto outside that limit.

If the population stood still the level of comfort of the whole people would be raised, but when the number of inhabitants increases some portion of them must turn to the use of lands that, before uncultivable, with the new discoveries may be made to yield an inferior living. Each advance of science may in this way be negated by the counter-advance of population; and, as knowledge raises the margin of cultivation, increase may again drag it down. In India as fast as the government, by irrigation, provides fresh land to raise the comfort of the people their rapid increase beats down the scale of subsistence.

When a people is in a position to be able to limit itself to the use of the better sorts of land then the sole circumstance which regulates the extent of its living is the state of scientific attainment.

But when a people is unable to restrict its cultivation to the better sort of land the value of scientific attainment may be largely diminished and even lost, and increases of knowledge may be rendered valueless as soon as they arise. If in addition to the superior lands the poorer also are cultivated the common dividend must be diminished. And where population increases to the very extreme limits of cultivability then, notwithstanding the employment of all the resources of civilisation, the condition of a large portion of the population must be removed only a degree from starvation. In the case of peoples obliged through press of numbers to call into use inferior qualities of land the standard of living is not determined by the degree of scientific advance alone, but also by the extent to which the benefits of knowledge are decreased through the recourse to inferior soils; and the scale of living is determined by the extent of science less the subtraction which follows from the descent of cultivation.

That a descent of cultivation diminishes the living of those who subsist by agricultural work must be clear, and this is amply borne out on a comparison of the agricultural wages of the Old and New Worlds; but what is not so clear is that it affects other wages; if, however, the wages of other callings are also compared it will be found that the descent of agriculture affects them equally (see Table No. IX).

A plenty or scarcity of land vitally affects the well-being of a people. For, observe, precisely the same methods as overseas being employed in the United Kingdom, Germany, and France, yet the living of the people is much inferior to what it is in the United States, Canada, Australia, and New Zealand. The

comparative shortage or superfluity of land exerts in this case a hundred per cent. influence on living. The wages of North America and Australasia are what the present state of knowledge permits, achieved because in those countries there is no recourse to inferior soils. While in Europe, although there is as much good soil as in the other parts of the world, living is beaten down by the cultivation also of inferior soils.

TABLE NO. IX

Comparative table of wages in the principal countries of Europe and of the New Worlds.

Kinds of Labour.	1909-1913.	
	Average Rate of Wages in United Kingdom, Germany, and France: given in Shillings per Week.	Average Rate of Wages in United States, Canada, Australia, and New Zealand: given in Shillings per Week
Agricultural labourers . . .	17s.	36s.
Transport workers . . .	24s.	52s.
Textile workers . . .	27s.	47s.
Engineering trades . . .	35s.	60s.
Building trades . . .	36s	80s.

But low as the wages in Europe are they are not so low as they might be and have been. It is possible for a human being to live on wages of two or three shillings a week, and in countries where overcrowding has reached great limits this is the scale of living of a large part of the people. When this is the case it is not uncommon to hear the low scale of subsistence attributed to any but the true cause—the shortage of land. It is usually mistakenly attributed to an inferiority of the workmen. But that this is not the case is proved when the workmen of such countries come into equal competition with those of the supposedly superior class. When Chinese and Indians,

for instance, emigrate to America and Australasia they perform the same work and receive the same wages as the other labour of the country. It is therefore no inferiority but the extreme descent of cultivation that obliges them in their own countries to be satisfied with the meagrest of wages.

The state of Europe was formerly no better than that of Asia, and that state might have endured to the present day. But with the modern era there set in those great improvements in the power of labour and in the capacity of land—the fruits of science. The shortage of land has been mitigated by bringing in more land, and yet without any descent of cultivation, for although more of the surface has been brought into use its cultivability has been raised by science, and, on the whole, the descent of agriculture is not so great as it formerly was. Thus a larger population is better fed from the same territory that before ill supported a much smaller number. The condition of the people of Europe would have been still more improved had their increase of population been not so great or the advance of science been greater still. Their future state will depend upon the respective rates of increase of population and knowledge. At present the ratio between the three determining factors—land, population, and science—is such that it enables them to obtain a living just the half of what they might get if the controlling conditions were in a proper equipoise.

To sum up, human well-being may be stated to be determinable by human knowledge; the ingredients for food being practically infinite, the extent of living must ultimately depend upon our capacity for turning them to account. The method at present in use, however, is able to take and convert but an insignificant part of the infinite material which surrounds us, and it is employable only under the sufficient rays of the sun, and on certain parts of the earth's surface.

Knowledge certainly is ever improving the process and rendering it capable of yielding more food to an equal outlay of labour, but the maximum of which the system is susceptible is attainable only on a portion of the earth—roughly the eighth part of the dry surface. When food-making is carried on at such places men's living is determined by the state of science and increases with its extension. But when subsistence is gleaned from other portions of the earth this extent of living is detracted from by the refractory nature of the medium to which the agricultural method is applied. Labour which should be devoted to the conversion of food is spent not on this operation, but in fashioning aright the medium. Hence the subsistence of many nations is not regulated by the volume of the world's science (though they may and many of them do employ it to the full), but by the shortage of their land, the medium through which the art of food-making to-day works.

The remedy for land shortage.—For some of the populations of the world such a state of things seems inevitable, for as long as they propagate at their present rates it is useless to place at their disposition fresh portions of the earth's surface. The alleviations which they might thereby gain would be dissipated in a short time by a congestion of population again on the new tracts of land, and until their characteristics undergo a change it is futile to contemplate an improvement of their condition by placing at their disposition more land. We shall therefore leave out of consideration the contemplation of an improvement in the lot of such people.

The characteristics of the European peoples are, however, quite different; they do not exhibit either the same capacity for increase or the same recklessness in giving it rein as do the Asiatics and Africans; it is even possible to contemplate a regulation of their

pace of increase to accord with the extent of their resources and the progress of knowledge, and it is allowable therefore to speculate upon a permanent improvement in their condition.

The resources now available in the world are sufficient to provide all of the European stock with land enough to make it unnecessary for them to bring into cultivation the inferior grades, and the possibility accordingly exists of making the sole regulator of their condition the extent of science.

A review of the capacity of the insufficiently peopled continents of the New Worlds will show the extent of good land now available on the earth.

The population of Europe is about four hundred million souls, and to maintain themselves they employ 30 per cent. of their land surface, using nearly all of it as arable land. The land well suited for cultivation, however, is only an eighth, or about 12 per cent., of the whole. Europe employs two and three times more land than this because its population is two and three times greater than can be maintained by the use of the good land alone. If the people were to confine their food-making to the superior soil, it would be possible to provide only for a hundred and fifty millions, and about two hundred and fifty millions must be removed, or must draw there subsistence from elsewhere. Does there exist elsewhere in the world good land capable of supporting such a large number ?

The North American Continent, being roughly twice the size of Europe, should be able to maintain from its superior lands alone (allowing them to be 12 per cent. of the total surface) a population of three hundred millions. The same number should be similarly maintainable in South America, which approximately equals the North in size. And Australia, being of about the same area as Europe, should be able from its better land to support a population of a hundred and fifty million souls.

These three territories are capable of affording sufficient good land to maintain seven hundred and fifty million people, while their combined populations are at present not two hundred millions. There is therefore present in those quarters a superfluity of territory capable of accommodating on good land five hundred and fifty millions, which is more than twice the present excess population of Europe. It would therefore be quite possible by spreading the excess population of Europe over the New Worlds to provide good land for all its inhabitants.

It is no part of this work, however, to advocate the spreading of the excess population of Europe over the less populated parts of the earth, nor to examine how such an end might be attained. It is sufficient to observe that the living of the people of Europe is beaten down below the scale which the state of knowledge and the land resources of the world are at present capable of affording.

A shortage of land will beat down subsistence whatever the social system of society.—The principle that a people's subsistence depends on its land, although laid down in general terms without reference to the system under which the distribution of production takes place, or to the question of property in land, applies equally whatever the method of distribution or of land tenure.

Suppose production to take place under the system of private property in land, then as long as there is a *superabundance* of land cultivation will be restricted to the better quality, all persons will be able to have as much of good land as they want, and the subsistence of everybody therefore will be regulated entirely by the power which science gives to labour and by no other cause.

But when the amount of good land is not sufficient for the maintenance of all the inhabitants, some of them

must resort to inferior soils. The living of the latter will no longer be regulated by science solely, but will be also affected by the quality of the land which they use, and as decreasingly inferior qualities of land are forced into use the living obtained by some part of the population will be correspondingly reduced.

Under the system of *private ownership*, therefore, the well-being of a people is determined, if it has sufficient land of the better quality, only by the state of science ; and if it has not, then by the inroads which the descent of cultivation makes on the living which science otherwise would have provided.

If, however, instead of producing under the system of private ownership a people go about the business of *getting food in common*, the principles regulating the extent of their subsistence will be the same. With an excess of land they will use only those portions ready fitted by nature for cultivation and, as no part of their toil will be dissipated in ameliorating land, labour will yield a return conditioned only by the state of science, and the share of each man at this stage will be large.

But should the suitable land prove insufficient there must occur a lowering of the margin of cultivation ; labour despite an equal use of knowledge will not produce so much, and everyone's portion will be less than it was before the better lands gave out. This process will continue as population presses and no fresh lands are found until, when the last lands are reached below which cultivation of no sort is possible, the share of each man may be just sufficient to maintain him, and in unfavourable seasons insufficient.

In a state of the common division of all things therefore, as well as in that of private ownership, the living of a people is decided by the extent of land at their disposal.

CHAPTER IV

FROM a consideration of the subsistence of society as a whole we will proceed to a discussion of the mechanism whereby science and land govern 'wages'—the subsistence of a section of society.

The landless man, or wage earner, is a natural phenomenon, and not a product of the institution of private property. It was formerly supposed that the agricultural labourer was doomed to servitude because he was unable to obtain land. The facts, however, of the New Worlds where there is land to be had by everybody do not bear this out. The statistics of agricultural labour in the New Worlds show that there are as many land labourers there as here (see Table No. X).

TABLE NO. X

Table showing the number of agriculturalists who work on their own land and the number who work for others.

Country.	Total Agriculturalists.	Working on their own Land.	Working for Others.
United Kingdom .	2,280,954	510,954	1,770,000
Germany . .	9,883,000	5,558,310	4,324,690
France . .	8,176,570	3,777,000	4,399,570
United States .	10,380,000	5,700,000	4,680,000
Canada . .	1,044,690	544,690	500,000
Australia . .	537,310	210,080	327,230
New Zealand .	126,609	77,229	49,380

In the principal countries of Europe the number of agriculturalists who work for hire roughly equals the number of those who work on their own land, and in the United States, Canada, Australia, and New Zealand an identical proportion appears of those who work for themselves. In the case of the new countries it cannot be suggested that there is a shortage of land, or that anyone who desires to obtain land cannot be satisfied, and as nevertheless agricultural hired labour is as numerous there as it is here it appears to be the case that the institution of agricultural labour for hire arises from natural causes, suits the needs of a large portion of the rural population, and is not due to an inability to obtain land.

Agricultural wages are set by the plenty or scarcity of land.—The willingness of agricultural labour to hire itself out is, however, not absolute but conditioned by the inducements offered. The agricultural hand is both able to employ his own labour and will do so unless the advantages of hire equal those which he could obtain by working for himself.

Where a people have a superabundance of cultivable land at their disposal cultivation will be restrained to the superior qualities, and the agricultural labourer will have the power of taking up for himself land of the same kind. He will do so if the wages offered to him do not approximate to what he could make for himself on land of this nature. Therefore his wages must be about what he could make for himself on good land. Here the abundance of land and the choice which it offers sets the wages of agricultural labour.

On the other hand, when a country is thickly populated and inferior land has been brought into use a labourer instead of accepting low wages can also go to work for himself. But then he can get only some of the remaining land which will be of a degree of

inferiority determined by the extent of the pressure of population on the land. His returns will be low and he cannot demand any higher wages than he could make for himself. In this case therefore the wages of agricultural labour must be less than in the former case, and how much less will depend exactly on the degree to which the margin of cultivation has been lowered. The plenty and the shortage of land account for the high wages of agricultural labour in the new continents and their low state in the old. These circumstances also explain why progress has so much more benefited labour overseas than in Europe. In America and Australasia the workman in default of satisfactory wages can use science upon selected portions of land, inexpensive to work, and therefore is able to make correspondingly good terms with his employer. In the old countries, however, with the same extent of science at his command the labourer will find only inferior qualities of land left upon which to use it. His returns therefore will be less, and his power of bargaining for employment is therefore reduced and he is obliged to accept the equivalent of what with all the uses of science the infertile land left over will yield him. The low agricultural wages of Europe obtain despite the aids of science because the land left and at the disposal of the workmen is not of the high quality which it is on the other side of the hemisphere.

It is often suggested that the difference in wages on the two sides of the world is due to a difference in the quality of the labour. But this is not the case. The agricultural wages in the Anglo-Saxon countries overseas are (or were before the war) 36s. a week to the 17s. of Europe (see Table No. IX). But the labourer of Europe on transferring himself overseas receives the higher rate of pay. Similarly, if the overseas agricultural labourer came to Europe he would

receive the rate prevailing here. The difference between the wages of the European and overseas labourers is not due to any difference in their capacities ; the new communities are populated from the old and their people are the same. The difference between the European and New World wages is the result of the difference of their states of agriculture. The wages of 36s. a week indicate the degree of living that science is capable of affording when cultivation is not pressed down. This wage would be earned by the agricultural labour of Europe if the population of the Continent was proportioned to its land resources. The amount they now obtain is the measure of the descent of cultivation, which is such that it has reduced wages to just the half of what they might be.

The wages of non-agricultural workmen are also set by their country's resources in land.—The wages of workmen other than the agricultural are also reduced by the descent of cultivation, and depend upon land resources as much as if they were engaged upon the land. And indeed they are mainly so occupied, though this is not apparent.

It is natural to separate the other workers from the peasants and to think that the scale of their living is determined differently. But it is impossible in fixing the causes of wages to separate any category of workmen. All classes of workmen merge one into the other ; they interchange their occupations and they are all engaged in the making of food.

A survey of the nature of the labour of non-agricultural workers will make it apparent that they are employed in assisting and furthering agricultural production.

Before discussing their functions, however, it is necessary to take note of the circumstances which have made their emergence possible. It will be found that

these centre round iron and coal—and, of course, the scientific knowledge which permits of their use.

The most useful medium for employing the discoveries of science is the metal iron. Nearly all the means by which it has been possible to add to human energy and to increase its efficiency depend for their success upon the use of iron : as, for instance, the implements of agriculture, the machines of manufacture, and the vehicles of the modern transport system.

The use of iron induces a need for coal ; without this cheap form of energy for smelting and treatment the great employment of iron upon which civilisation rests would be impossible.

Coal beyond its use for the treatment of iron also plays a second rôle ; it affords a source of energy far beyond that of the capacity of human beings and makes possible the cheap manufactures and economic transport of the day.

The part played by manufacture is likewise twofold. Manufacture makes up iron both into implements for the agriculturists and into engines for its own use and for the transporter. In addition, supplied with iron machinery and coal energy the manufacturer makes up the products of agriculture.

The employment of iron and coal creates the need for a transport system, since the products of manufacture must be delivered to each separate farm, and the raw material for treatment collected from every separate holding.

The natural spots for the production of iron wares and the manufacture of raw products are the seats of the most favourable occurrence of coal and iron ; there the miner, the iron worker, and the manufacturers of raw products all assist in the application of science to the making of food in the following way :

The miners and the fashioners of iron are nothing more

than a portion of the agriculturalists detailed to perform certain services ; their calling requires that they withdraw to selected spots in the world. The transporters then are evolved to bring the iron makers or, what is the same thing, their products back to the land.

Different is the contribution of the makers up of the raw produce of agriculture ; their work does not assist directly but indirectly in the process of food culture. By withdrawing from the farms and working at the seats of coal their labour is magnified and increases the amount of energy at the disposal of the agriculturalists ; because instead of being obliged to make his own manufactured articles the land worker is able to obtain them at a cost represented by much less labour than he would have had to devote to them himself. Thus he is left with more labour to give to his pursuit proper, and the coal-machine manufacture of products promotes increase on the farms.

Miners and manufacturers are accordingly engaged, some of them directly in the work of agriculture or food manufacture by making the necessary instruments, and others indirectly in the time which through the use of coal they save for the agriculturalists.

What reason is there for supposing that the living of these workers will be any different from that of the agricultural labourers ? They are a part and parcel of the whole scheme of production from the land, and must stand or fall by the quantity of the ultimate product. It is impossible to raise a barrier between them and the other workmen or to hedge them round with advantages, though this is sometimes attempted.

It is true that the earnings of a skilled workman are almost invariably more than those of an agricultural labourer, but then so are they more than the wages of the labourers engaged in their own trades ; the superior wages being due as the term suggests to their skill.

But though their wages are more than those of labourers, yet the scale on which they are paid seems to be exactly proportioned to the amount of living which the common labourers earn. This can be seen in Table No. XI.

TABLE NO. XI

Table showing the wages (in 1913) for agricultural and town labour in Europe and overseas.

—	Agricultural Labour.	Transport Workers.	Textile Workers.	Building Trades.	Engineering Trades.
	Shillings per Week.				
Europe—					
Germany . . .	15	22	25	35	30
France . . .	16	23	26	36	32
United Kingdom . .	18	25	28	37	40
United States . . .	36	50	46	80	60
Canada . . .	36	50	46	85	60
Australia . . .	36	55	48	75	65
New Zealand . . .	36	55	48	80	60

This table shows that both in Europe and in the New Worlds the wages of skilled trades are higher than those of agricultural labour by from 50 to 100 per cent. In each case it is agricultural labour apparently that sets the unit whence the wages of other labour are calculated, since in Europe with low wages on the land wages in the manufactures are low, while in the New Worlds with high agricultural wages those of manufacture are high. It is certain that the higher wages of skilled labour overseas is not due to any superiority on their part over European skilled labour, since the skilled workers in the New Worlds are all derived from Europe and can be no better than the stock whence they come; their high wages therefore are not due to any greater capacity on their part.

That the high wages of skilled and manufacturing trades overseas are due to the high wages of agricultural employments seems to be deducible also from the workings of the fiscal policies which those nations have adopted. Before the adoption of protection the manufactures of the New Worlds did not flourish. The workmen though no better than those of Europe were disinclined to accept the European scale of wages, while the masters in the face of European competition could not pay more. Consequently the labour was not forthcoming in sufficient numbers and the manufactures languished. Skilled men preferred local trades, such as building and transport, in which they were not subject to foreign competition and could demand wages commensurate with those of the land labourer. However, with protection from the competition of foreign manufactures the workmen in the manufactures were enabled to demand, and the employers to pay, wages which corresponded to those of the rest of the labour of the country. Thereupon manufacturing labour was forthcoming in sufficient numbers, and in this way there was built up those flourishing manufactures paying high wages which exist in the United States, Canada, and Australia. In this case it seems certain that the remuneration of the manufacturing trades is graded from that paid in agriculture.

If plenty of land and high agricultural wages lead to high wages in the manufactures it should also be true that in countries of land shortage with low agricultural wages the skilled workmen are obliged to accept low wages. That the case is so in fact is indicated by the figures of pay of the agricultural and non-agricultural classes of the United Kingdom, Germany, and France exhibited in Table No. XI, and since the skilled workmen of Europe are none other than the same as those overseas, there would seem to be no way of

accounting for the difference of the wages of this class of labour on the two sides of the world except the one put forward here.

The principle of the dependence of other wages upon those in agriculture appears to be at work regulating the pay of skilled trades in countries of a lower state of subsistence than that of Europe (as indeed must be the case if the theory is correct). In China an artisan is to be obtained for a shilling a day ; but this is not due to any inferiority or to his low standard of life—to which it is commonly attributed ; overseas he earns the same rate of pay as the workmen of the country. In China, however, the pressure of population on land is so great and agricultural wages are so low that workmen can be found to qualify themselves for skilled trades at a remuneration just above the pittance which the agricultural labourer obtains.

It appears that town wages follow the country scale everywhere. In the United States, Canada, Australia, and New Zealand, with agricultural wages the highest in the world, those of the trades and towns are equally high ; in England, France, and Germany, with the pay of agricultural labour lower, the wages of skilled and town labour are all lower, while in the East, with the conditions of agriculture the worst of all, the pay of the skilled labour is the lowest in the world. In each case the intrinsic worth of the artisan's services however are the same ; he performs the same work and to the same amount. But in the first case he exchanges his labour with a well-paid agriculturalist and therefore requires and can receive equally high pay ; in the second he exchanges with an agriculturalist of moderate condition and must be content with a moderate return ; while in the third case he exchanges his work with that of agricultural labour cultivating such poor land that he cannot demand, nor can the agriculturalist give him,

more than a bare livelihood. In each case the state of the town or skilled worker is determined by that of the agricultural labourer, and the state of the latter by the plenty or scarcity of land. Clearly therefore whether, and how far, agriculture has descended governs the living of the workers in the centres of industry.

The foregoing argument may be summarised as follows: In countries of an abundance of land the workman, as an alternative to the acceptance of unsatisfactory wages, has the opportunity of going to work for himself on land of good quality; therefore his wages must equal the amount which he could make for himself on good land.

In congested countries labour dissatisfied with its wages cannot take up good land but must take what is left over. Such land will be of an inferiority proportioned to the degree in which population has pressed on the land resources and cultivation has descended. The alternative constrains the workman to accept wages according with what he could make upon land of this sort. On the degree to which cultivation has been pressed down will depend the extent to which the workman's wages are decreased from what they would be if there was no lack of land.

This manner of ascertaining wages, although it seems to be applicable only to the workmen of the land, applies equally to all classes of labour. It is to production from land that the labour of all men, even of those in the towns, is directed, and it is the product which this joint labour yields that fixes the extent of their living. The town worker, can demand no better living than the country worker, and *vice versa*; each body reacts upon the other and maintains an equilibrium of proportionate rewards for services. When a superiority in any employment temporarily discloses itself the re-

muneration of all forms of labour soon becomes equalised by a transfer of workmen from the less to the more profitable. In short, all labour being devoted to production from the land can receive merely that which it itself makes ; it cannot receive more and (in most cases) does not receive less ; and the extent of its living therefore must be dominated by the quality of the land upon which it works.

A shortage of land reduces wages on the good land to what they are on the bad, and produces scarcity rent.—It will be as well to refer to those cases in which labour for hire obtains less than what it itself makes. In countries suffering a scarcity of land the workman upon the better land does not receive the whole of his product, but only so much of it as he could have produced on inferior land, and it is on the low quality land alone that he receives wages equal to his product. Such a state of things would be impossible in countries of an abundance of land, since it is merely necessary for the workman to take himself a good piece of land in order to reap all that he can make. Consequently in those countries upon all lands the workman receives the full value of what he himself produces. But in overpeopled countries the workman upon the superior land does not receive remuneration equal to all he produces owing to the descent of agriculture. Had there been no overcrowding he could have obtained a portion of superior land, and any who wished to employ him must have paid him what he could make on such land ; but as he cannot obtain such land he is forced to accept wages equal to what he could make on inferior land. The remedy by which the workman can always obtain the whole of the product of his labour is the same as that by which he can be relieved from low wages ; it consists in putting at his disposal a sufficiency of better quality land. Then upon the superior land he must receive all he makes, while

as there will no longer be need to cultivate inferior land low wages will altogether cease.

In the case above referred to where the workman does not receive the whole of the value of his production the difference goes as rent, and hence it is common to blame rent for the lowness of wages. But rent is itself one of the symptoms, not the cause of the descent of agricultural and low wages. If good land was to be had free no one would pay rent for land. By providing plenty of land the disease, which is the descent of cultivation, will be cured and rent for the unimproved value of land automatically abolished.

There are but two ways of improving the condition of wage-earners in Europe : one is to provide them with more land, or, if this is not possible, then the other is to attempt to bring about the greatest advance of science. The theories that are placed before the European workmen for the purpose of raising their wages and that take no note of the shortage of land or of the influence of science are for this reason misleading, and the pursuit of them is misdirected and wasted effort.

CHAPTER V

WE will pass on and consider some of the matters just discussed as they particularly affect the inhabitants of the British Islands.

Wages in the United Kingdom are set not by the state of cultivation there but by its state on the mainland of Europe.—The United Kingdom is not a self-sufficient country as for the most part are the other nations of Europe. On the mainland of Europe the country feeds the town, and the town supplies the country with its aids to agriculture and with its manufactures. The common stock whence both draw is their own land ; and the fortunes of each are regulated by the quality of land that must be brought into cultivation to satisfy the joint needs. In such cases the relation between town and country is direct, and the dependence of both upon the state of cultivation is plain.

In the British Islands, however, while many of the townsmen exchange with their own countryside they are not dependent on it for a living ; they can draw subsistence from other parts of the earth. The country labour likewise is not limited to an exchange with the towns, but can join the manufactures and draw its sustenance from abroad. What, then, is the relation of the countryman to the townsman in the United Kingdom and how (if at all) does the descent of agriculture affect their living ? For the factors which decide their fate we must look abroad, as it is not settled at home but in the markets of the world.

The United Kingdom does not manufacture pro-

ducts only for her own agriculturalists, but also for many cultivators in other parts of the world. Coal and iron occurring as they do perhaps more favourably within her frontiers than in any other part of the world—the coal certainly in greater abundance than anywhere else—fit her by nature to play the part of miner and manufacturer for many nations.

But there are nations besides herself endowed with coal and iron, to a greater or less degree, who likewise engage in the manufacture for distant markets. The following table exhibits their comparative productive power. It will be seen that the United Kingdom is by no means the first in production.

TABLE NO. XII

Comparative production (pre-war) of various countries in coal, iron, and textiles.

—	Coal.	Iron and Steel.	Consumption of Cotton.
United Kingdom . .	1	1	1 $\frac{1}{4}$
United States . .	1 $\frac{1}{8}$	3	1 $\frac{1}{4}$
Germany . . .	$\frac{1}{2}$	2	1
Austria . . .	..	..	
Italy . . .	..	..	
France . . .	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{2}{3}$
Belgium . . .	..	..	$\frac{2}{3}$
India . . .	..	..	
Japan . . .	..	..	

Among the manufacturing nations who compete for foreign trade the principal are the countries of the western mainland of Europe. These countries draw their workmen from populations reduced in living by the overcrowded state of their territories and the descent of agriculture. There the manufacturing hands must

work for the pay which the shortage of land forces other labour to accept, and the master manufacturer is thus able to produce manufactures at a very low price.

Now the price at which these manufactures are produced regulates the price at which we must sell ours. Of hardware and textiles, the principal subjects of exchange with the foreign farmer, the continent of Europe exports more than does the United Kingdom; before the war it exported annually 262 million pounds' worth to the 200 million pounds' worth sent abroad by the United Kingdom (see Table No. XIII).

TABLE NO. XIII

Exports (pre-war) from various countries of metal goods and textiles.

	Millions.		Millions.
Germany . . .	£120	India . . .	£17
France . . .	70	Japan . . .	8
Belgium . . .	20	United States . . .	40
Austria . . .	5	United Kingdom . . .	200
Italy . . .	5		
Switzerland . . .	15		
Russia . . .	2		
Holland . . .	18		
Spain . . .	2		
Sweden . . .	5		
Continent of Europe £262			

In all the markets of the world the manufactures of the continent of Europe confront ours, and unless we accommodated our prices to them our goods would find no purchasers. The wages of the workmen in the manufactures of this country are not governed by what their services are worth to the farmers of the world and what the latter could pay for them, but by the remuneration which the work-people of the continent of Europe are forced to accept; and as their rate of wages is dictated by the descent of their agriculture it follows that the

wages in the British manufactures are equally determined by the descended state of agriculture on the continent of Europe.

Observe the different state of the manufacturing workman in a country like the United States. He exchanges with his fellow-countrymen (and that they shall buy from him is enforced by common consent of the country through protection); he has for his customers agriculturalists carrying on the manufacture of food without descent of cultivation and, with a consequent high production, able to pay well for the services rendered to them; and therefore the wages of manufacture are good, being graded from those on the land. Living among such agriculturalists, the American manufacturing workman has no need to seek markets abroad, and would indeed be hard put to it to dispose of his wares in foreign markets. He would be unable to compete with the over-populated countries, his wages being higher than theirs, and consequently the American manufactures which do find their way into foreign markets are of small amount. Of hardware and textiles, for instance, the United States exports only a fifth of the amount of the United Kingdom. But this is by no means to be taken as the measure of the prosperity of her workmen; for consumption in their own country they manufacture on a larger scale than does the United Kingdom for her combined home and foreign markets. The case of the United States evidences that the well-being of a manufacturing population arises from the prosperity of the agriculturalists with whom they exchange, coupled with freedom from the competition of countries in a less favourable state of cultivation.

The United Kingdom, relieved from the competition of the countries of cheap labour, would be able to obtain in the markets of the world more for her manufactures than she does at present; for her customers are mostly

in a position to pay more, and not being able to manufacture for themselves, except at inordinate expense, it would pay them to buy from England at an enhanced cost. If we were relieved from such competition the wages of the United Kingdom would rise to the equivalent, and sometimes to more than the equivalent, of the wages of communities owning abundance of land. As it is, the United Kingdom largely attempts to create markets of this kind for her own, into which however she cannot prevent competitors from entering and keeping down prices and wages. Thus she develops the Argentine, Australia, and Canada, and formerly developed the United States, sending to these lands the equipment necessary to modern agriculture, and while opening up the territory provides a market for its produce through exchanging her aids to agriculture and manufactures for food and raw materials. These are all countries of an abundance of land and a well-paid peasantry, and could reward manufacturing services much better than they recompense the British artisan. But they will not pay him any more as long as they can obtain the manufactures of the European continent so cheaply.

In the home markets too the wages of British manufacturing workmen are decided by what the workmen of the continent of Europe are willing to accept. Foreign goods sell here as freely as ours, and the British master-manufacturer who has to pay the same for his raw materials cannot pay more for his labour than the continental nations do.

This view that British depend upon continental European wages will be combated, as it is a common opinion that our workmen are better remunerated than all the others, and certainly better than those of the mainland of Europe. To uphold our argument, therefore, we refer to Table No. XI, setting out the pay

of the principal employments in the United Kingdom, Germany, France, and overseas. It will be seen therefrom that wages in Britain are nearly the same as in France and Germany, and only the half of what they are overseas. They are about 10 per cent. more than in Germany and France, but fall into place with the wages of the rest of Europe when compared with the wages of the oversea countries.

The slight advantage of British wages over those of the Continent gives need for some inquiry in face of the statement that they are regulated by European wages. The difference, however, is accounted for by the superiority of the workmen of these Islands over those of the rest of Europe. It is difficult to say why British labour should be superior, but that it has been so for a long time is certain. The British workman earns more than his continental rival because his services are worth more measured by the same scale. In the same way British goods usually sell for a dearer price than the continental manufactures, but they are in effect no dearer than the nominally cheaper foreign article, having regard to the superior quality which they offer. Nevertheless, after giving credit to the British workman for the superiority of his labour and conceding that his better workmanship realises rather better wages than on the Continent, still it remains the fact that the wages of the United Kingdom are set by the conditions of affairs in Europe and are much less than overseas.

Though this appears to refer only to the manufacturing workman it concerns equally the country labourer. The state of agriculture in the United Kingdom is not fixed by the pressure of population as it is in the rest of Europe but by the condition of the manufactures. As the manufactures flourish men turn rather to them and rely on the exchange of their services

bringing them in more than the cultivation of inferior land ; while when manufactures are depressed the cultivation of inferior soils at home may afford a better recompense. Country wages in the United Kingdom, therefore, take their scale from the demand for labour in the manufactures ; but as the pay in the manufactures is decided by the Continent, in the end continental competition sets the wages of the United Kingdom in agriculture as well.

Probability of improvement of wages in the United Kingdom.—The condition of the people of the British Islands being determined by that of the populations of the adjacent countries, it becomes a matter of vital interest for them to inquire what the course of events among their neighbours is likely to be. Europe suffers from a lack of land and consequent depression of wages, but progress in science tends to raise the living of the people. On the other hand, expansion in numbers tends to decrease it, and upon the respective strength of the pull of these two forces will depend the state of the popular well-being. Which of these two forces has hitherto prevailed can be ascertained only by a comparison of the state of Europe at different periods. Such a comparison is set out in Table No. XIV.

From this table it appears that though the European numbers have greatly increased, the wages of labour have risen. It is impossible to draw from this circumstance any other conclusion than that the advance of science has not been overwhelmed by the addition to population ; on the contrary, the pace of science must have been greater than that of population, since it has effected an improvement in the condition of the people. There is reason to believe that this state of things will continue. The European rate of increase in numbers is at present not rising ; the evidence points to its diminishing. Science, on the other hand, moves with

cumulative momentum, for as the discoveries of this generation exceed those of the last, the scientific achievements of the next generation may be expected to excel those of the present day. The outlook for the future of this country is therefore not discouraging.

TABLE NO. XIV

Table showing that with the rise of science of recent years there has occurred in Europe a great growth of population accompanied by an increase of wages and a cheapening of food.

Year.	Total of the Combined Populations of the United Kingdom, France, Germany, Austria, Italy, and Belgium.	Average Wages of Labourers in these Countries per Week.	Average Price of Wheat in these Countries in Shillings per Quarter.
		<i>s.</i> <i>d.</i>	
1500	50,000,000	2 6	15
1600	60,000,000	2 6	30
1700	70,000,000	3 6	40
1800	100,000,000	5 0	80
1850	160,000,000	9 0	60
1880	190,000,000	14 0	55
1910	240,000,000	16 0	35

PART II—EMPIRE

CHAPTER VI

The influence of Empire upon wages.—Although the condition of the people of this Kingdom tends to improve with that of the peoples of the continent of Europe, yet it is not so good as it might be ; the wages of Europe are not nearly so high as those of the New Worlds, and while every improvement of science has an immediate effect upon wages in the New Worlds, in the Old only so much of its effect is felt as is not offset by the increase of numbers.

If the United Kingdom had a superabundance of land she could exchange with a population engaged in agriculture upon the superior soils only, and both her country and town labour would earn the fullest wages possible. With a sufficient home market she would not need to seek exchanges in foreign countries and suffer the competition of nations poor in land. But these Islands have behind them no stretch of territory—such as, for instance, have the manufacturing centres of the United States—or the condition of the people would be far different from what it is. Still, though Great Britain and Ireland have no such tract adjoining them, there exist within the Empire territories which could serve for an extension of the land of the United Kingdom. Canada, Australia and New Zealand are such territories. (South Africa, though sufficient in size and abundantly fertile, is not suitable for use as an extension of the British Isles. She possesses her own agricultural

population of coloured workers and presents no such openings for the introduction of white settlers as do the other Dominions.)

Had Canada, Australia and New Zealand adjoined the United Kingdom as Siberia abuts upon Russia, and as the west of the United States links up with the east, the exchanges of food and manufactured goods would have flowed naturally between these parts of the Empire and the Home Country, and our wages would have been the equal of those of America, Canada, Australia and New Zealand. But the Dominions are not continuations of the British Islands: their frontiers begin thousands of miles from the point where those of Great Britain end.

Formerly territories so widely separated could not have been constituted as a single productive area but must form distinct economic entities. Nowadays, however, distance is no obstacle, and it would be practicable to constitute the Mother Country and the Dominions one country. The latter through the revolution in the circumstances brought about by the application of science to transportation are for the purpose of the interchange of goods no further from the United Kingdom than some of the land contained within its own borders. Countries when the space which separates them is covered with water may be economically nearer to each other than if they had been joined by land. The following table indicates the cheapness of sea transport.

The ordinary expense of carrying goods (in 1884) in all countries was estimated thus :

					Shillings per Ton per 1000 Miles.
1 ton by highroad	.	.	.	.	300
„ by railway	.	.	.	.	100
„ by canal	.	.	.	.	20
„ by sea	.	.	.	.	5 ¹

¹ Mulhall, 4th edition, p. 301.

Although we say that Australia, Canada and New Zealand could serve as extensions of the land of the United Kingdom, the capacity of new territories to support much population is always doubted ; and therefore, although Canada and Australia are each about the size of Europe and New Zealand as large as the United Kingdom, we must inquire if their power to support human life is equally great. It has been said that Australia is arid and Canada frost-bound. Superficial area alone is not conclusive evidence of a country's ability to support population, and it must always be ascertained as a fact how much of a country is available for the manufacture of food. Norway, for instance, with an area equalling that of Great Britain and Ireland, is incapable owing to its rocky surface and cold climate of maintaining as many people as are contained in London. Moreover, seeing that of the people of the United Kingdom a half are supported from without in food, and all are supplied thence with most of the raw commodities for manufacture—cotton, wool, timber, leather, and the like—we must ascertain whether these three Dominions, in addition to maintaining their own populations, would be capable of providing these things for such a large number of people.

The amount of commodities which the three Dominions would be required to supply to the United Kingdom if they are to form with her a self-satisfying entity can be expressed in money terms. Until the war the United Kingdom imported for her own use annually 500 million pounds' worth of commodities, of which Canada, Australia and New Zealand contributed only eighty-two million pounds' worth. Could these Dominions multiply their exports to us six or seven times ? This was formerly doubted, and with the information then available it was impossible to say what the capacity of those Dominions was. Accordingly the

Imperial Conference which met in 1911 resolved that inquiry into the resources of the Dominions should be undertaken, and on the 15th day of April 1912 there was constituted the Dominions Royal Commission. The Commission visited Canada, Australia and New Zealand, held upwards of a hundred sittings, and received evidence from some 500 witnesses.

Table No. XV sets out the amount of imports with which the three Dominions must supply the United Kingdom if her general exchanges are to take place with them.

TABLE NO. XV

Table showing (roughly) the amount of the imports of the United Kingdom which should be supplied by Canada, Australia and New Zealand if the exchanges of the United Kingdom are to take place in the main with those three countries.

	Millions.
Average imports into the United Kingdom for the five years 1909-13	£700
Less re-exports	100
Net imports for home consumption	£600
Of which imports of manufactured goods	£100
Imports of miscellaneous goods not suited for production in the three Dominions	50
	150
Leaving as balance amount of United Kingdom imports which should be supplied by the three Dominions	£450
Of this amount the three Dominions sent us annually (1909-13) only	82
Leaving amount by which the exports of these Dominions to the United Kingdom would need to be increased	£368

Before the war the United Kingdom imported every year 700 million pounds' worth of commodities, but the

commodities which she need have imported were much less than this in amount.

A hundred out of the 700 millions of imports were not required for use in the United Kingdom, but were re-exported.

Of the 600 millions of remaining imports a hundred million represented manufactured goods. Now if the United Kingdom conducted her exchanges with the Dominions these imports would become unnecessary and would be replaced by home manufactures. This leaves a total of 500 million pounds' worth of necessary imports.

From this total must be deducted fifty million pounds' worth of miscellaneous articles, consisting of such things as sardines, spices, yeast, camels' hair, silk, esparto, hay, ice, ivory, guano, nitrate of soda, phosphate of lime, &c., with which the Dominions are unlikely to supply us and which we must continue to import from elsewhere.

With this exception the necessary imports of the United Kingdom, it will be argued, were and are of a nature which the Dominions could supply. We shall discuss their capacity to do so.

It is sometimes said, however, that the capacity of the Dominions to satisfy our needs is already sufficient if only they sent the whole of their products to us and not to other countries. It is true that the eighty-two million pounds' worth of food and raw produce which the three Dominions sent us by no means represented the whole of their production available for export. Canada exchanged as much, Australia more than as much, with the rest of the world as with the United Kingdom. This suggests the thought that their trade with us could be considerably increased if the commodities which they send to other countries were sent hither instead.

The accompanying table (No. XVI) shows the state

of the exports of the three Dominions to the United Kingdom and to the other countries of the world.

TABLE NO. XVI

Table showing for 1909-13 the amount of the exports of Canada, Australia and New Zealand to the United Kingdom and the amount which went elsewhere but might be diverted to the United Kingdom (in millions of pounds sterling).

—	Total Exports.	To U.K.	To other Countries.	Divertible to U.K.	Total Exports possible to U.K.
Canada . . .	61	31	30	19	50
Australia . . .	74	34	40	16	50
New Zealand . .	21	17	4	1	18
	156	82	74	36	118

This table exhibits by how much the trade of the three Dominions with the United Kingdom could be increased by diverting hither some of their present exports to other countries, and it appears that the amount which could by this means be added to the exports of these Dominions to the United Kingdom is thirty-six million pounds.

A detailed examination of the exports of the three Dominions discloses the fact that not all of them are fitted to swell the trade with the United Kingdom. Of the thirty million pounds' worth of exports which Canada sends to countries other than the United Kingdom eleven million pounds' worth consists of commodities which the United Kingdom could not take, having already as much of them as she requires. Silver, gold, coal, manufactures and fish account for most of this eleven million pounds' worth.

Australia similarly has twenty-four million pounds' worth of exports which we could not take, consisting, as to fifteen million pounds, of wool beyond our requirements, and, as to the balance of nine millions, of a trade with South Africa, New Zealand and countries of the East which it is necessary and desirable to maintain.

Again, of the New Zealand exports to foreign countries valued at four million pounds, a million pounds' worth is wool over our requirements, another million pounds is represented by gold, half a million by coal, and half a million by miscellaneous commodities none of which we require, leaving only a million pounds' worth of the foreign trade of New Zealand which could be diverted to the United Kingdom.

Of the seventy-four million pounds' worth of exports which the three Dominions now send to foreign countries, therefore, only thirty-six million pounds consists of agricultural, animal, forest and mineral products which this country requires and are divertible to the United Kingdom.

The transfer of this amount of trade, however, would swell quite inconsiderably the amount of exports which the three Dominions must send to the United Kingdom if they are to supply all her needs. It would increase their exports to her from eighty-two million pounds to 118 million pounds, while her necessary imports amount to 450 million pounds. It is therefore hardly to a divergence of the present foreign trade of the three Dominions that the United Kingdom must look for the satisfaction of her needs, but rather to the creation of a vast new production on their part.

A prerequisite to production on such a scale is the possession of sufficient cultivable land, and therefore we must turn our investigation in the first place to inquiring into the extent of the Dominions' land resources. This

matter was fully investigated by the Dominions Royal Commission, and as a result of their labour it is impossible now to doubt that in Canada and Australia are to be found areas of cultivable land ample to supply the needs of the United Kingdom.

To deal with Canada first, the Commissioners found there 330 million acres of cultivable land awaiting use. Such a figure conveys very little to the mind ; but if we observe that the belligerents on both sides in the late war—the United Kingdom, France, Italy and Belgium on the one side and Germany and Austria on the other—had taken all together not such an area of cultivable land with which to feed the 200 millions of their inhabitants we shall have some conception of the magnitude of the figure mentioned by the Commissioners. This large area of land is situated not within the arctic regions of Canada, but along the great belt which now constitutes the granary of the Dominion.

In Australia the Commissioners encountered a state of things equally impressive ; they compute that the land suitable there to a production of wheat amounts to 200 million acres, of which only twelve and a half millions are now producing this cereal. An area of land so large as that is sufficient to provide the people of the United Kingdom ten times over with their requirements of wheat.

As to New Zealand, the evidence given to the Commissioners showed that there still remains in that Dominion tracts of land which require only clearing to add to the cultivation of the country.

CHAPTER VII

It is not enough, however, to show that a country possesses the land for an agricultural production; it is necessary also to inquire how far this land is suitable for the many very different sorts of production that modern states call for. Table No. XVII exhibits in detail the requirements of the United Kingdom in raw commodities.

This table shows how far the three Dominions are already supplying the United Kingdom with her imports of raw commodities; by how much they must increase their exports if they are to satisfy all her needs; and in what cases they have hitherto furnished none of her requirements and must create new industries. The commodities have been placed in categories according to the ease or difficulty with which the production of them by the Dominions can be enlarged or created. These commodities will be considered *seriatim*, and the capacity of the three Dominions to produce them sufficiently for the United Kingdom's requirements or to produce them at all will be examined.

The following is the table (No. XVII) showing how the United Kingdom was supplied with food and raw materials (for her own consumption) from 1909 to 1913:

(There were in addition the fifty million pounds' worth of miscellaneous imports referred to in Table No. XV.)

TABLE NO. XVII

		By Home Production.	By Imports.	The Source of these Imports was as follows:	
		Million Pounds stlg.	Million Pounds stlg.	From Canada, Australia and New Zealand.	From other Countries.
1st Category	Cereals	40	79	19	60
	Meat	38	25	10	15
	Bacon	20	20	1	19
	Butter and cheese	10	31	11	20
	Wool	4	20	20	...
	Fresh Milk	20	...	...	...
	Potatoes	50	...	...	...
2nd Category	Eggs	4	9	...	9
	Lard	1	5	$\frac{1}{2}$	$4\frac{1}{2}$
	Oils, vegetable and animal	2	6	$3\frac{1}{2}$	$2\frac{1}{2}$
	Condensed Milk	...	2	...	2
	Margarine	1	4	...	4
	Currants	...	2	...	2
	Wine	...	4	...	4
3rd Category	Tobacco	...	5	...	5
	Leather and skins	6	19	$5\frac{1}{2}$	$13\frac{1}{2}$
	Flax, hemp and jute	...	12	1	11
	Seeds (oil)	...	13	$\frac{1}{2}$	$12\frac{1}{2}$
	Wood	1	34	4	30
4th Category	Sugar	...	24	...	24
	Cotton	...	65	...	65
	Tropical produce—				
	Tea	...	10	...	10
	Coffee	...	3	...	3
	Cocoa	...	3	...	3
	Rice	...	3	...	3
5th Category	Copra and palm oil	...	3	...	3
	Rubber	...	7	...	7
	Metals	15	31	6	25
	Petroleum	...	6	...	6
	Coal for home consumption 100 (exported 50)	100	...	...	...
5th Category	Sundries	...	5	...	5
		321	450	82	368

The First Category

Cereals.—The cereals which the United Kingdom imports comprise the following varieties :

—	Imported from Canada, Australia and New Zealand.	Imported from other Countries.
	Millions. £18	Millions. £34
Wheat and flour	£18	£34
Barley	1	7
Oats	...	5
Maize	...	12
Peas	...	1
Beans	...	1
	£19	£60

Wheat.—In the face of the finding of the Commission as to the available supplies of wheat-land in Canada and Australia there can be no question of the ability of those countries to supply the United Kingdom with the large amount of wheat which she now imports from other countries.

Barley, Oats, Maize, Peas, and Beans.—The following are the areas devoted to these cultivations in the three Dominions :

—	Areas sown to—			
	Barley.	Oats.	Maize.	Peas and Beans.
	Acres.	Acres.	Acres.	Acres.
Canada	1,500,000	10,000,000	300,000	200,000
Australia . . .	200,000	800,000	350,000	40,000
New Zealand . .	30,000	350,000	800,000	20,000

The large areas which they already devote to these cultures afford proof of the capacity of the three Dominions to provide all the United Kingdom imports

of these commodities. It may be remarked that Canada is the best country in the world for the production of maize, the yield per acre being twice as much as anywhere else.

Meat, Bacon, Butter and Cheese.—The following are the details of the meat, bacon, butter and cheese imported into the United Kingdom :

—	Imported from Canada, Australia and New Zealand.	Imported from other Countries.
	Millions.	Millions.
Beef	£3	£12
Mutton	7	3
Bacon	1	19
Butter	6	18
Cheese	5	2
	—	—
	£ 22	£54

Beef.—Australia now mainly furnishes us with the beef that comes from the Dominions, and it is from that country that we could get the large quantities which we now obtain elsewhere, subject however to what follows. There are in Australia vast tracts of land suitable for the grazing of stock available, but they are occasionally subject to drought, and will become death traps for the cattle unless facilities are provided for transporting the stock to where water can be had. The increase of the ranching industry in Australia therefore at present awaits the extension of railroad communication in that country. (See the evidence of the Chief Commissioner for the New South Wales Railways at p. 262 of the Minutes of Evidence taken by the Dominions Royal Commission in Australia, Cd. 7171.)

Mutton.—Two-thirds of our mutton imports now come from New Zealand and Australia. With such a

present pre-eminence in this trade their ability to supply the whole of our import requirements cannot be questioned.

Bacon.—Canada and Australia are both proved pig countries, Canada having three million and Australia a million pigs (the United Kingdom possesses four million pigs). Each of them produces a large amount of bacon, but not much more than suffices to satisfy their home demands. There can be no question of the suitability of these countries for the production of bacon.

Butter.—Our contributions from Australia and New Zealand are considerable. The fact that these countries already send us six million pounds' worth obviously proves their capacity for this export, and shows that it requires only an expansion of their present industries to enable them to supply the large amount which we now get from other countries.

Cheese.—The honours for producing the cheese set out in the table are divided between New Zealand and Canada. Seeing that they already send us five million pounds' worth, it is obvious that they are capable of giving us another two million pounds' worth and supplying all our import requirements.

Wool.—Wool (and tallow) are the sole commodities of which the Dominions at present supply enough to us.

The detailed review so far covers the staple products of agriculture—cereals, meat, dairy produce, and wool. These form the largest class of British imports, amounting to 175 million pounds' worth. Towards this total the three Dominions contribute at present sixty-one million pounds' worth. To enlarge their production and cover the whole of our requirements they need merely the provision of a sufficient population and adequate transit facilities. These commodities therefore occupy the first category of the table.

Second Category

In the second category—a smaller one, our import requirements amounting only to thirty-seven millions—are placed commodities the production of which besides calling for population requires some thought and planning. They are, however, products of which all, or very nearly all, could well be supplied by the Dominions.

Eggs.—Twenty years ago large numbers, amounting annually to £500,000 worth, were sent to the United Kingdom from Canada, who demonstrated her capacity to supply this country with eggs in competition with the rest of the world. Since then her exports to us have dwindled to nothing. The requisite organisation, however, should enable her again to take a place in this considerable industry. Seeing that Russia, which ordinarily sends us most eggs, is an almost equally distant country, Canada should not be at a disadvantage in the production and shipment of this article.

Lard.—Canada already supplies us with a considerable amount of lard, and with attention given to the matter is quite capable of increasing her exports. In Australia, too, it is the case that there is already a large production of lard, absorbed however usually by local requirements, but when that country has had a surplus of the commodity she has been able to export it to us at prices equal in cheapness to those of the rest of the world.

Oils.—As the three Dominions already send us more than half of our imports of vegetable and animal oils it is obvious that they could increase their contributions of these substances ; of tallow, indeed, we receive from Australia and New Zealand a surplusage which we export. Particularly could the imports of fish oil from the Dominions be increased, since the Dominions Royal Commission report that the Canadian fishing industry

and production of fish oil are capable of considerable development. It is only in the production of palm and coco-nut oil that the Dominions are unlikely to be able to supersede our present sources of supply.

Condensed milk.—Seeing that Canada and Australia already manufacture and export condensed milk, the British imports of this commodity should be quite capable in time of being supplied by those Dominions.

Margarine.—Margarine and oleo margarine are also at present exported from the Dominions, and these industries of theirs could with a sufficient labour force supply all our requirements.

Currants.—Australia produces currants, but hitherto the production has been absorbed by the home market. The industry, however, is rapidly progressing and Australia will easily be able to provide all the currants required by the British market.

Wine.—Australia produces a good deal of wine, and the area of her vineyards shows a continuous increase. According to the evidence of Mr. Moody, the Commissioner of fruit industries, there are a million acres of first-class vineland in Western Australia of which only 7,000 are in use, and there is therefore no doubt of the ability of Australia to provide all the wine required in the United Kingdom.

Tobacco.—There are in Canada ten thousand acres under tobacco and in Australia five thousand. In all the States of Australia where the cultivation of tobacco has been tried the soil and climate appear to be very suitable for the growth of the plant. The tobacco industries of Canada and Australia could, if the necessary labour was forthcoming, be expanded sufficiently to supply the needs of the United Kingdom.

Generally.—Of the articles contained in the second category it appears that the Dominions could, with attention paid to their production and with an extension of

the industries—which involves a supply of more labour—satisfy nearly all our import requirements.

Third Category

The third category of British imports amounts to 102 million pounds in value, to which the Dominions at present contribute eleven million pounds' worth.

Leather and skins.—The following are the details of our imports of leather and skins :

—	U.K. Requirements.	Now sent us by the three Dominions.
	Millions.	Millions.
Leather	£10	£2
Hides	5	$\frac{1}{2}$
Goat and sheep skins	3	2
Furs	1	1
	—	—
	£19	£5½

Hides and skins.—If the three Dominions diverted to this country the hides and skins which they now send to other countries they could satisfy all our requirements of this commodity.

Leather.—The three Dominions send us all the leather that they have for export ; they cannot send us more unless they can obtain more skins. The increase in the supply of skins, however, depends upon the augmentation of the stock which the country bears, and this upon transport. With further development and with a diversion of trade the Dominions are quite capable of supplying all our needs in leather and in skins.

Flax.—The United Kingdom imports annually four million pounds' worth each of flax, hemp, and jute. The flax and hemp could easily be supplied by Canada and New Zealand and the jute probably by Australia. Canada is a flax country with 500 thousand acres now

devoted to this cultivation and a production worth two million pounds—only enough, however, for her own requirements ; while New Zealand has sent us as much as a million pounds' worth of hemp annually. For these two countries to supply our total imports of flax and hemp resolves itself merely into a question of providing them with the requisite labour force. For jute we must look to Australia, which is considered to be suitable for this cultivation and to encourage the production of which the Australian government has authorised bounties of nine thousand pounds a year.

Oil seeds.—The United Kingdom receives little of its oil seed requirements from the three Dominions. But half of the imported seeds are of flax, and if the cultivation of that plant was extended the production of seeds would also be sufficiently increased. Canada, indeed, has now a large export of this product which, if it were all diverted to the United Kingdom, would go a long way to satisfy her needs.

There is also a large quantity of cotton seed imported into the United Kingdom. The production of this seed within the three Dominions must depend upon the development of a cotton-growing industry, a matter which is dealt with in the next category.

Wood.—The following are the details of the United Kingdom's imports of wood :

—	U.K. Requirements.	Sent from the three Dominions.
	Millions.	Millions
Sawn fir	£16	£3
Pulp	4	$\frac{1}{2}$
Pit props	3	...
Miscellaneous	11	$\frac{1}{2}$

Sawn fir.—The three million pounds' worth of sawn fir which we receive from the Dominions comes from Canada. The Commissioners find that Canada possesses

resources sufficient to supply all our requirements of sawn fir. They point out that at present she produces no more than Germany, which possesses only a tenth of her timber. The supplying of this vast amount of material to us by Canada resolves itself into a question of the provision of the necessary transport and labour.

Pulp.—The pulp at present imported into the United Kingdom comes almost entirely from foreign countries, but the Commissioners report that Newfoundland will in future become one of the most important contributors to the world's supply. Although it is only in the last eight years that this industry has been introduced into that country, the possession of suitable water power has enabled the trade to make great strides.

Props.—A separate Commission sent to Canada and Newfoundland during the war reported that these countries were capable of satisfying all the requirements of the Mother Country in pit props.

It appears, therefore, that Canada and Newfoundland are capable of providing all the sawn firs, pulp, and pit props for the United Kingdom, and thus satisfying twenty-three millions out of the thirty-four millions of imports of wood into the United Kingdom.

Sugar.—None of the three Dominions sends us sugar. Canada has long grown sugar-beet, and has at present a cultivation of 20,000 acres under this sort of sugar; Australia has as much as 150,000 acres under sugar-cane; but neither of these countries has any surplus of sugar for export. With such extensive areas under sugar cultivation each of these Dominions has proved its capacity for sugar production. Countries of limited population, however, cannot carry out every cultivation on a large scale, and for Canada and Australia to supply the United Kingdom with her requirements in sugar becomes a matter of being furnished with the requisite population.

Generally.—With more population and development the three Dominions could supply to the United Kingdom nearly all the articles contained in the third category just as well as they are now obtained elsewhere.

Fourth Category

Here cotton is the outstanding feature, and the consideration of the production of this commodity raises the question of whether the Dominions can grow cotton. The Royal Commissioners answered the question affirmatively. They say that Australia is well fitted to be a cotton growing country, and that the area of land available for this cultivation is enormous. Cotton has been planted in Queensland and New South Wales for a number of years, and at times as much as 60,000 pounds in weight has been produced.

Australia possesses two advantages for cotton growing: the quality of her cotton is high—superior to that of America—and it ripens over a longer period than in any other country, and the Commissioners think that these advantages will enable the present difficulties in the way of establishing the industry to be overcome. It is said that Australians regard the work of cotton picking as mean, and fit only for black labour, and that in any case Australian labour is too dear; but the Commissioners do not admit the validity of either of these objections. They point out that at the home of the cotton industry in Texas and California white labour cultivates and picks most of the cotton, and that, alternatively, the higher quality of the Australian cotton would support a greater outlay on labour. The employment of special labour for harvesting makes the picking of cotton in Australia expensive, and the Commissioners say that if advantage were taken of the much longer ripening period and of the drier weather of Australia this casual labour could be eliminated. In

the fruit districts of Australia many of the growers form themselves into co-operative associations for picking and marketing their fruits and thus save the expense of harvesting labour; and the Commissioners see no reason why analogous organisations should not be developed in regard to cotton growing. The cost of labour in their opinion is not an obstacle to the success of the industry, and if this is so then the conditions of Australia must be in every way suitable for the establishment of the cotton industry.

Tropical products.—There are £29,000,000 worth of tropical products which the British Islands now import from tropical countries other than the three Dominions; but Australia possesses the capacity for production of this sort. The Instructor for Tropical Agriculture in Queensland told the Commissioners that Australia is well endowed by nature for the cultivation of tropical products, and coffee, rice, rubber, and cocoa have all been grown there with success.

It is generally supposed, however, but without sufficient reason, that in the tropical industries white cannot compete with coloured labour. Yet there is no warrant for such a belief. The fact that these commodities are now produced with coloured labour is due to the accident of their having arisen in countries where the population is a coloured one. Where an industry is carried on both by coloured and white labour the latter is quite able to hold its own. Wheat cultivation illustrates this fact. India is one of the great wheat-producing countries of the world, and has an output six times that of Australia, yet Australian wheat tends to drive the Indian out of the British market, while the wages of Australian labour are 36s. a week and those of Indian only 3s. a week. The supposed greater cheapness of coloured labour is clearly not a bar to the capture of an industry by white labour, and if it was desired to grow all our tropical products in Australia with white

labour this could be done and need result in our paying no more for the products than we do now.

Fifth Category

The following are the details of the United Kingdom's imports of metal:

—	Total U.K. Import Requirements.	Received from the three Dominions.	Received from other Countries.
	Millions.	Millions.	Millions.
Iron	£7	£0	£7
Copper	9	2	7
Lead	4	1	3
Tin	4	1	3
Zinc	4	1	3
Manganese	1	0	1
Silver	1 $\frac{1}{2}$	$\frac{1}{2}$	1
Gold	$\frac{1}{2}$	$\frac{1}{2}$	0
	£31	£6	£25

Iron.—There is in Newfoundland much iron mined, but it is impregnated with phosphorus, and was sent to Germany for treatment. The higher grade iron of the world, however, shows signs of giving out, and the Commissioners think that we shall soon be glad to turn to the phosphoric ores of Newfoundland.

There is good iron to be found in many parts of Australia, and in particular large deposits occur in the 'Iron Knob' and the 'Iron Monarch' mines, now producing ore which makes a high-class steel. There is also good ore in Tasmania; and in the North Island of New Zealand there is a large deposit of iron of good quality. In all these cases, however, the present cost of transport deprives the United Kingdom of the use of the ores. Our imported iron ores come mainly from Spain. If this supply gave out and we had to go farther afield, or if the cost of transport between Australasia

and the United Kingdom could be cheapened, our import requirements of this metal could be easily satisfied by the Dominions.

For this reason and on general grounds the Commissioners very strongly recommended that the ports of the Empire should be deepened. It seems that the larger the ship the cheaper the transport, and large ships cannot be built unless there are deep harbours to receive them. At this day the cheapening of transport within the Empire is impeded by the lack of depth of many of the harbours.

Copper.—At present Canada produces yearly two million and Australia three million pounds' worth of copper, but this is only a small part of their capacity. In British Columbia, say the Commissioners, production of copper is increasing rapidly and will continue to increase, while in Australia the quantity produced is insignificant in regard to what is available. For instance, in one district of Queensland—Cloncurry—rich deposits of copper are known to exist over several thousand square miles.

Canada and Australia together now produce five million pounds' worth of copper, and our import requirements are nine million pounds' worth; the two Dominions therefore could supply us with most of our imports of copper, but they do not do so; they send us only two million pounds' worth, since nearly all the Canadian copper and some of the Australian goes to foreign countries.

Lead.—Of the four million pounds' worth of United Kingdom lead imports Australia supplies one million pounds' worth, and could supply two million pounds' worth if her exports of this metal to other countries were diverted to the United Kingdom; also her mines, which are the largest in the world, are capable of producing more than they do at present.

In Canada, too, there is lead—a present production

of 20,000 tons, but growing rapidly and (in the opinion of the Commissioners) certain to increase.

Tin.—Of the three Dominions Australia is the tin producing country, and sends us about a million pounds' worth a year. She might send us also the further three million pounds' worth which we require, since payable tin occurs in every state of the Australian Commonwealth and in Tasmania.

Zinc.—Of the four million pounds' worth of zinc imported before the war into the United Kingdom a million pounds' worth came from Australia, and three million pounds' worth from other countries, principally from Germany. But the latter was really Australian zinc, for the treatment of which the German and others had put up large works. Australia could supply the United Kingdom directly with all her zinc imports if the treatment of the ore took place either where it was mined or on arrival in the United Kingdom. When the Commissioners reported, a plan to do this was about to be carried out, and it was anticipated that Australia would directly supply all the zinc requirements of the United Kingdom.

Manganese.—This mineral comes mostly from India, but there exist extensive unworked deposits in Australia, and some in New Zealand and Canada.

Silver.—Of the one and a half million pounds' worth required annually by the United Kingdom only half a million pounds' worth comes from the Dominions, and this strangely enough from Australia, although the great silver producing Dominion is Canada. Canadian silver is exported to the United States, while the balance of the United Kingdom requirements are imported from South America.

Gold.—The import requirements of the United Kingdom in gold are small, and the half million pounds' worth received from Australia satisfies them.

Summary of metals.—It will be seen that some of

our metal needs the Dominions could now satisfy almost entirely by sending us the whole of their production ; and of the rest many of our requirements could largely be met from the Dominions if the difficulties of transport were overcome.

Petroleum.—No petroleum comes to the United Kingdom from Canada, Australia or New Zealand. Oil is found in Australia and in New Zealand, where at one spot there was produced as much as a million gallons ; but the cost of production hitherto has been too great. Canada holds out the hope of supplying the United Kingdom's needs in petroleum. The Commissioners say that ' no other part of the North American Continent gives such promise of new oil fields as the basin of the Mackenzie River in Canada,' and as this region is unexplored they urgently recommend that a complete survey of it should be made as early as possible.

General summary.—It appears that the three Dominions are capable of supplying very nearly all the necessary imports of the United Kingdom. The conditions requisite for their being able to do so vary with the categories of articles. The first and largest category requires merely an access of population ; the second besides population calls for attention to be devoted to the production ; while the third category demands attention in a higher degree. The fourth category, involving as it does the establishment of new industries, raises special difficulties, which however are capable of being overcome. The fifth category comprises not objects of agricultural production from the soil—a matter amenable to human ingenuity—but of extraction from the earth, a prior condition of whose production is their presence. It appears however from the foregoing survey that the mineral deposits of the three Dominions are largely adequate for the supply to the United Kingdom of the minerals which she now obtains from other countries.

CHAPTER VIII

The supplying of population to the Dominions.—The first necessity of the Dominions, without which a production on their part sufficient to satisfy the needs of the United Kingdom could not take place, is human energy, and we must see, therefore, what means exist for satisfying this demand. It is agreed that a population derived from the British Isles would be the most

TABLE NO. XVIII

Table showing proportion of population engaged in production from land in various countries.

—	Engaged in Agriculture.	Population.	Proportion.	Percentage.
Germany .	10,000,000	65,000,000 (of whom 15 millions live on imported products)	1 in 5	20
France . .	8,000,000	40,000,000	1 in 5	20
Italy . . .	10,000,000	40,000,000	1 in 4	25
America (U.S.) .	10,000,000	100,000,000	1 in 10	10
Canada . . .	1,000,000	8,000,000	1 in 8	12
Australia . .	500,000	5,000,000	1 in 10	10
New Zealand .	100,000	1,000,000	1 in 10	10

suitable for the purpose, and it is therefore a matter of inquiry how far the United Kingdom would be able to afford the large numbers of people whose aid is necessary for such a greatly enhanced production.

What is the number of people whose transportation

would be necessary if the three Dominions are to supply most of the United Kingdom's imports? This can be discovered by ascertaining the amount of labour which would be requisite to enable the United Kingdom and the Dominions to provide themselves with food and raw materials; and an approximate estimate as to this can be arrived at by observing the number performing these services among other nations of the world.

From Table No. XVIII it will be seen that in Europe the proportion of agricultural workers is one in five, while in the New Worlds it is only one in ten. This is because the New World agriculture is two or three times more productive than that of Europe. If the agricultural products of the United Kingdom for the future are

TABLE NO. XIX

Table showing population of United Kingdom, Australia, Canada, and New Zealand, and proportion now engaged in agriculture.

—	Now engaged in Agriculture.	Population.	Number of Agri- culturists which would be required on a ten per cent. basis.
United Kingdom .	2,400,000	46,000,000	6,000,000
Canada . . .	1,000,000	8,000,000	
Australia . . .	500,000	5,000,000	
New Zealand . .	100,000	1,000,000	
	4,000,000	60,000,000	6,000,000

obtained mainly from the Dominions, it will be sufficient to make a provision for the Dominions and the United Kingdom of one agricultural worker to ten of population.

Table No. XIX shows the present number of agriculturists in the three Dominions and in the Home

Country, and indicates by how many they would have to be augmented to allow these territories to be mutually self-supporting.

The combined population of the United Kingdom, Australia, New Zealand, and Canada being sixty millions, they would on a ten per cent. basis require an agricultural population of six millions for the satisfaction of their needs. The present number of their agriculturists being four millions, it would be necessary to augment them by a further two millions, and this is the first number which we obtain of the amount of population which the United Kingdom would be required to supply to the three Dominions.

TABLE NO. XX

Table showing the number of transport, trade and domestic workers employed in relation to agricultural workers.

—	United States.	Canada.	Australia.	New Zealand.
Number of agriculturists . . .	10,000,000	1,000,000	500,000	100,000
Number of transport and trade workers .	6,000,000	350,000	300,000	80,000
Number of domestic workers . . .	5,500,000	450,000	200,000	40,000
	11,500,000	800,000	500,000	120,000

But the modern agriculturists require to be furnished with assistance in the shape of transporters and performers of trade and domestic services, and, in the experience of the New Worlds, the number of transport, trade and domestic workers must about equal that of the agriculturists. This appears from Table No. XX.

Hence we see that the emigration to the Dominions of two millions of agricultural workers would require also the emigration of an equal number of transport, commerce and domestic workers. This therefore brings the total number of workers with which, to be mutually self-supporting, the United Kingdom would have to supply Canada, Australia and New Zealand to four million souls. It remains to be seen what the capacity of the United Kingdom is for furnishing such a large body of emigrants.

The population of the United Kingdom has since 1871 increased by four and a half millions every ten years (see Table No. XXI), and seems still to be increasing at this rate.

TABLE NO. XXI

Table showing the increase in the population of the United Kingdom since 1871 and the number who have emigrated. (Based on the Report of the Dominions Royal Commission.)

—	U.K. Increase of Population.	Number who Emi- grated from U.K.
1871-1881 . . .	4,300,000	1,000,000
1881-1891 . . .	4,500,000	1,600,000
1891-1901 . . .	4,300,000	700,000
1901-1911 . . .	4,900,000	1,200,000
Total for 40 years .	18,000,000	4,500,000
Ten-yearly average in- crease . . .	4,500,000	1,125,000

Here then is available the number of people required to make the United Kingdom and the three Dominions self-supporting ; it is but necessary to emigrate them. From the figures of emigration shown in this table it

appears that already a million of our surplus population emigrates, and the Commissioners report that the present tendency of this emigration is in the direction of the Dominions.

It appears therefore to be possible for the United Kingdom to find the number of new population required by the Dominions ; but can the Home Country supply emigrants of the proper class, namely, two million agriculturists and two million other workers, of whom a million must be domestic ? This is a question upon which there has hitherto been serious misgiving. ' The United Kingdom can spare none of her agricultural population ' say the Dominions Royal Commissioners, and those most expert emigrators, the agents of the Canadian Pacific Railway, found in late years that they could get no emigrants from the British countryside, the local demand for labour was too great ; while as for domestic helps the British supply is admittedly insufficient for the home demand.

In the face of this it would appear that the proper class of emigrants cannot be supplied by us to the Dominions ; that the only sort which can go from these shores consists of the transporter and commercial workers.

The Dominions Royal Commissioners, however, after investigations conducted in this country and in the Dominions, come to another conclusion. They find that a domestic and agricultural class can be made, and that the materials out of which to make it exist in the United Kingdom. Two conditions only are necessary—youth and adaptability.

They say that the origin of the emigrant—whether he is from town or country—is immaterial, and what his previous occupation has been is of no concern, provided only that he (or she) is young. Next important after youth is the qualification of adapta-

bility, and this, as the experience of the Dominions themselves shows, is more often present in the town than in the country youth. New South Wales and Victoria have both taken youths from towns in the United Kingdom for farm work, and with great success. South Australia is now following their example. In New Zealand also English town-bred lads have provided labour for the land and their worth has been proved. The Commissioners are accordingly satisfied that from town youths in the United Kingdom having no previous experience of agriculture the country labour requisite for the Dominions can be obtained.

The Commissioners give practical advice based on the evidence which was put before them. In their view the suitability of the migrant should be tested. For this purpose they recommend the establishment in the Mother Country of government farms where elementary training should be given under men acquainted with the methods of the country to which the migrant proposes to go, and with separate farms for each Dominion. It would be enough to accustom the intending emigrant to the handling of horses, the milking of cows, and the use of machinery and implements employed on farms overseas; the testing of character and suitability would remain the chief feature, and the greater part of instruction in farming should take place in the Dominions. To this end the Dominions should establish centres for the instruction of immigrants; in Australia there already exists an institution of this nature.

The training areas for males ought to be supplemented with training centres for females for instruction in cheese and butter making, the care of poultry and domestic science.

CHAPTER IX

THIS review of the resources of the Dominions demonstrates that they are well able to provide for the United Kingdom the means of subsistence which she now draws indifferently from all countries of the earth. A scheme for constituting them for productive purposes a part of the United Kingdom is accordingly physically capable of realisation.

The importance of such a scheme lies not merely in the ability of these Dominions to produce all the primary products which the United Kingdom now imports, and thus to make her independent of other sources, but in their capacity to produce them while paying high wages and without increasing the price of the product beyond that at which the United Kingdom purchases elsewhere in the markets of the world. This result is attainable only by reason of the enormous stretches of cultivable land, far exceeding the requirements of generations to come, contained within the Dominions. This circumstance and the use of science make the wages of the Dominions as high as possible, and will keep them at the highest even were those countries so to extend their production as to satisfy the whole of the British market.

It remains to see how the inhabitants of the British Islands could be brought to benefit from such a state of affairs.

As it is, the inhabitants of the United Kingdom exchange indifferently with all nations of the world and encounter the competition of other countries, and thus the United Kingdom is shackled by the terms

which those countries are willing to accept. If the United Kingdom could rid herself of this devastating competition her labour might enjoy much higher wages.

The principle exists by the application of which the wages of the manufacturing workmen of Great Britain could be brought to the most that science affords.

If it is arranged that the Dominions supply all the food and raw material imports of the United Kingdom, then it must follow that in exchange the Dominions must receive all the manufactures by which the United Kingdom now pays for those imports.

Such an exchange, however, would not assist the British workman unless the Dominions allowed him to earn the same rate of wages as that which they pay to their own workmen. And this result can be brought about only if the Dominions agree to place restrictions upon the import into their territories of foreign manufactures.

It is in short only by raising a protecting fence to embrace in one area the United Kingdom, Canada, Australia and New Zealand that the work-people of the British Islands could be benefited by the plan of exchanging principally with the Dominions. Under the ægis of a common protection the workmen of the United Kingdom would no longer be forced to cut their wages to the equivalent of those of their competitors. Freed from the competition of less fortunate nations their wages would be settled by the rates obtaining in the Dominions. For as the United Kingdom, Canada, Australia and New Zealand would then be in the condition of a single country supplying its own food and raw materials and performing its own manufactures, the rate of wages throughout the entity would be determined by two circumstances only: the first, the extent of land at the disposal of the population, and the second, the degree of their scientific attainments.

Now the extent of land of such a combination of countries is very much more than their populations

would require, and therefore wages would not be reduced by any shortage of land. Relieved of this cause of depression, wages then would depend only on the extent to which use was made of modern knowledge ; and as in these countries science is availed of to the fullest extent, wages everywhere would be as high as they are capable of being.

As we saw, abundance of land coupled with a full employment of science makes the wages on the land the greatest possible ; and the high wages of the land bring it about that the wages in other callings must be correspondent for the requisite labour force to be attracted. Owing to this cause the wages of manufacturing, building, transport and commerce in the Dominions are so high. If therefore the exchanges of the United Kingdom took place with the three Dominions, and the four countries conducted their affairs as a single self-sufficing country, then the wages of the United Kingdom must equally rise to the height of what they are in the three Dominions.

The state of the people of this Kingdom stands as follows: Wages are the extent of the living which the wage-earner himself makes, and if those wages are to be increased he must be put in a position to make a larger living. This will follow not so much from the enlargement of his productive power in the manufactures—though these also play a considerable part—but from the enlargement of his productive power upon the land. His capacity for production in the latter respect is seriously diminished by the employment of inferior grades of land ; and if therefore productive power upon the land is to be heightened the inferior land must be abandoned in favour of land of a higher quality. That there is no shortage in the supply of superior land is certain.

This land, however, is not in the keeping of the people of the United Kingdom, but in that of the inhabitants

of the Dominions, and to obtain its use the United Kingdom must come to an understanding with the Dominions.

The nature of that understanding is as follows :

The United Kingdom is unusually well endowed for the manufactures, possessing coal to a greater extent than any other country in the world and containing a manufacturing population superior to any other. All the advantages for manufacture exist, therefore, at least as favourably in the United Kingdom as anywhere else in the world.

On the other side of the reckoning the Dominions possess resources in land greater altogether than are to be found in any other country.

The circumstances exist, therefore, for a highly favourable exchange between the country where in all the world manufacture can take place most advantageously and those countries where agricultural production is carried on with the greatest success. An exchange of products between these two groups would carry with it the maximum of advantage to each of them, the one side obtaining the best and cheapest manufactures in the world, the other the best and cheapest agricultural products.

For such a state of things to be brought about it requires only the conclusion of an agreement between the parties and the carrying out of the measures to make the agreement effective.

First of these measures is the supply of a sufficient population to the Dominions to enable them to produce the import requirements of the United Kingdom.

The second is to establish a protection over the United Kingdom and the Dominions in order to prevent their plans for a common exchange of products from being subject to the interference of other nations.

The establishment of such a state of affairs would benefit both the Dominions and the Home Country. The Dominions would obtain an access of population

and a rapid development which would be of advantage to all of their inhabitants.

The United Kingdom would be put in a position much more advantageous than the present. Her work-people would no longer be subject to the competition of foreign nations whose wages are low, but only to that of the Dominions whose wages are high. Consequently wages in the United Kingdom would advance until they corresponded with the wages obtaining in the Dominions. Those wages have as their basis the prosperous state of agriculture, and the wages of the United Kingdom being graded by them would be supported by the only strong foundation for high wages—that which is laid upon an abundance of land and an advanced state of science.

Failing the adoption of a scheme such as this, wages in the United Kingdom cannot rise to what an abundance of land makes possible ; they must continue to be set by those of Europe, where the shortage of land keeps wages down. What the chances are of European wages rising has already been estimated, and though the conclusion reached was that conditions in Europe tend to improve, still the improvement is unlikely to be so great as to make the condition of the European work-people equal to that of the populations overseas. If therefore the United Kingdom cannot come to such an arrangement as has been set out above with the Dominions, wages in the United Kingdom will never be as good as they might be. And if the circumstances which decide wages are such as are set out in this work, neither can the other schemes presented to the people of this country for the improvement of their condition bring about the result at which they aim.

